

Q770

Multiscanning Color Monitor

TECHNICAL SERVICE MANUAL



www.telemaster.ru

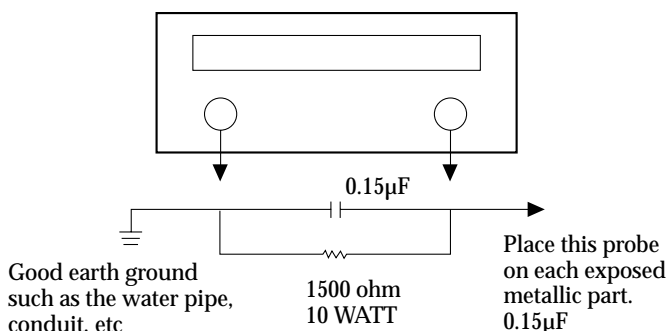
Safety Precaution

WARNING

Service should not be attempted by anyone unfamiliar with the necessary precautions on this monitor. The followings are the necessary precautions to be observed before servicing.

1. Always discharge the high voltage to the CRT conductive coating before handling the CRT. The picture tube is highly evacuated and if broken, glass fragments will be violently exploded. Use shatter proof goggles and keep picture tube away from the bare body while handling.
2. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as nonmetallic control knobs, insulating covers, shields, isolation resistor capacitor network etc.
3. Before returning the monitor to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as signal connectors, terminals, screw heads, metal overlays, control shafts etc, to be sure the monitor is safe to operate without danger of electrical shock. Plug the AC line cord directly into a AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1500 ohm per volt or more sensitivity in the following manner : Connect ground(water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC Voltage across the combination of 1500 ohm resistor and 0.15 μF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. The Voltage must not exceed 0.3 volts RMS. This corresponds to 0.2 milliamp AC. Any value exceeded this limit constitutes a potential shock hazard and must be corrected immediately.

AC VOLTMETER



INSTRUCTIONS TO USER

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instruction, may cause interference to radio and television. It has been tested and found to comply with the limits for the specifications in Subpart J of Part 15 FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

X-Ray Radiation Precaution

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must be under the specified limit. The nominal value of the high voltage of this monitor is $25KV \pm 1.0KV$ at zero beam current (minimum brightness) under a 120V AC power source. The high voltage must not (under any circumstances) exceed 30KV. Each time a monitor requires servicing, the high voltage should be checked.
It is recommended the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. This monitor is equipped with a protection circuit which prevents the monitor from producing excessively high voltage. Each time the monitor is serviced, the protection circuit must be checked to determine that the circuit is properly functioning.
3. The only source of X-RAY RADIATION in this monitor is the picture-tube.
For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
4. Some parts in this monitor have special safety-related characteristics for X-RAY RADIATION protection.
For continued safety, parts replacement should be undertaken only after referring to the product safety notice.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this monitor have special safety-related characteristics. These characteristics are often not evident from visual inspection.

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features identified by " \triangle " in the replacement parts list and schematic diagram.

For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-RAY RADIATION or other hazards.

PRODUCT CDRH NOTICE

Electrical potentiometers which is marked as caution " \triangle " in parts list are critical components of safety & CDRH.

Therefore, for continued protection, replacement parts must be used which is used in original PCB ASS'Y.

General Information

1. Description

This 17" (16" viewable) color display monitor is operated in R, G, B, drive mode input.

2. Operating instructions

2-1. Front

Menu, Select, Down (▼), Up (▲) DPMS(Power)LED, Power Switch

2-2. Rear

Input connection [AC & SIGNAL CABLE]

2-3 Service Instruction(internal controls)

H-Center , H/V Focus

2-4. OSD Controls

Brightness/Contrast, H/V-Position, H/V-Size, Pincushion/Trapezoid, Pin Balance, Parallel, Top/Bottom-Corner, H/V-Linearity Rotation, H/V Moire, Degauss, Color Control, Information, Language, OSD H/V- Position ,Recall

3. Electrical Characteristics

3-1. Power supply

Input Voltage : 100-240 V AC

Input Current : 1.5A Max.

Input Frequency : 50 - 60Hz

Power Consumption : 70W (TYP)

3-2. Video input signal

Input : 0.7 Vp-p analog signal(at 75 ohm terminated to ground)

Polarity : Positive

Rise/Fall time : < 5ns

3-3. Horizontal Synchronization Signal

Level : TTL High : 2.4V min

Low : 0.4V max

Polarity : Negative or Positive

Frequency : 30kHz - 70kHz

Timing Limits : Pulse width ($0.1\mu\text{s} \leq \text{Thp} \leq 6\mu\text{s}$)

3-4. Vertical Synchronization Signal

Level : TTL High : 2.0V min

Low : 0.4V max

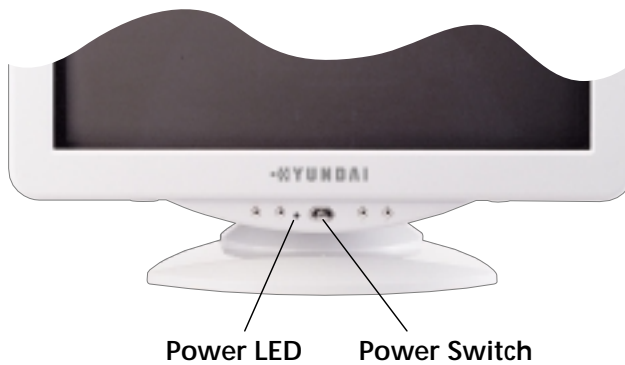
Polarity : Negative or Positive

Frequency : 50Hz - 150Hz

Timing Limits : Pulse width ($8\mu\text{s} \leq \text{Tvp} \leq 2.048\text{ms}$)

Control Description

Front View



Video Input Signal

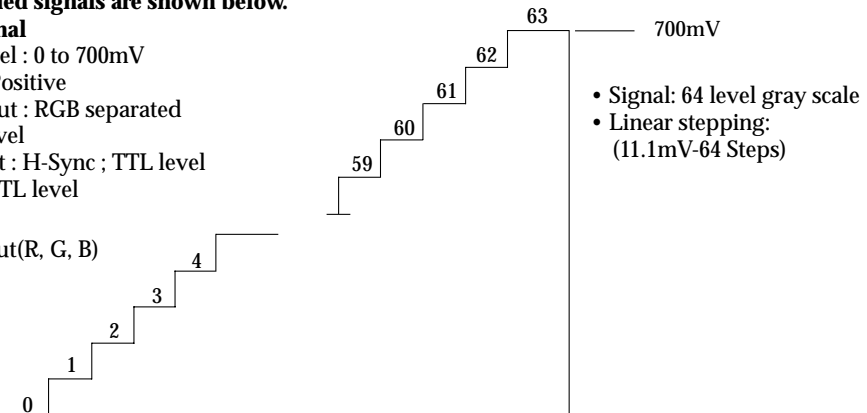
Recommended signals are shown below.

• Video Signal

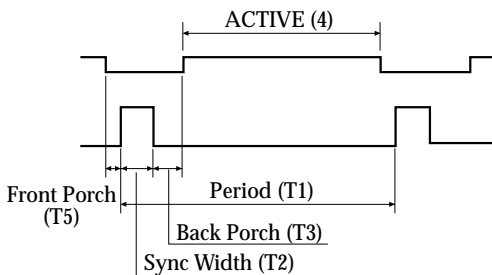
Video Level : 0 to 700mV
 Polarity : Positive
 Video Input : RGB separated
 Analog level
 Sync input : H-Sync ; TTL level
 V-Sync ; TTL level

• Waveform

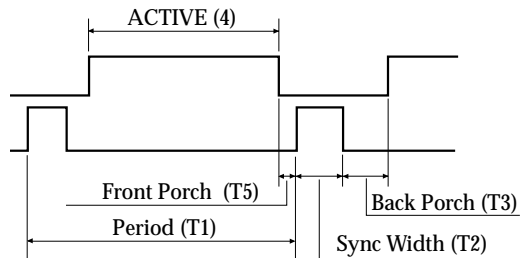
Video input(R, G, B)



• H-Sync



• V-Sync



• Timing Table

Horizontal	Dot	720	640	640	800	800	800	1024	1024
Frequency	kHz	31.469	43.269	50.625	46.875	53.674	63.920	60.023	68.677
Period(T1)	μs	31.778	23.111	19.752	21.333	18.631	15.645	16.660	14.561
Sync Width(T2)	μs	3.813	1.556	1.580	1.616	1.138	1.185	1.219	1.016
Back Porch(T3)	μs	1.907	2.222	1.975	3.232	2.702	2.015	2.235	2.201
Active(T4)	μs	25.422	17.778	15.802	16.162	14.222	11.852	13.003	10.836
Front Porch(T5)	μs	0.636	1.556	0.395	0.323	0.569	0.593	0.203	0.508

Vertical	Line	400	480	480	600	600	600	768	768
Frequency	Hz	70.080	85.008	100.05	75.000	85.061	100.03	75.029	84.997
Period(T1)	ms	14.268	11.764	9.995	13.333	11.756	9.997	13.328	11.765
Sync Width(T2)	ms	0.064	0.069	0.059	0.064	0.056	0.063	0.050	0.044
Back Porch(T3)	ms	1.081	0.570	0.435	0.448	0.503	0.501	0.466	0.524
Active(T4)	ms	12.711	11.093	9.481	12.800	11.179	9.387	12.795	11.183
Front Porch(T5)	ms	0.413	0.023	0.020	0.021	0.019	0.047	0.017	0.015
Interlaced	ms	1.577	0.671	0.514	0.553	0.577	0.610	0.533	0.582
Sync Polar	H	-	-	-	+	+	+	+	+
	V	+	-	-	+	+	+	+	+
Interlaced	Y/N	N	N	N	N	N	N	N	N

The monitor is compatible with additional modes within the specified frequency ranges provided that they are different at least for one of the following :

Horizontal Freq.: $\pm 1.0\text{kHz}$

Vertical Freq.: $\pm 1\text{Hz}$

Note: Even if the monitor detects the input timing as a factory preset mode, the size and position may not be able to be set as desired. Check the input timings are under the specifications and adjust the image as you want.

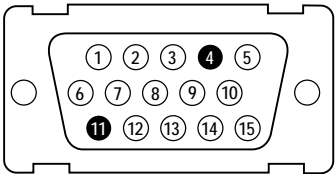
For better quality of display image, use the timing and polarity shown in the table above. Please see your video card user's guide to ensure compatibility.

Video Input Terminal

A 15 Pin D-sub male connector is used as the input signal connector.
Pin and input signals are shown in the table below.

Pin Description		
SIGNAL PIN NO.	SEPERATE SYNC	COMPOSITE SYNC
1	RED	RED
2	GREEN	GREEN
3	BLUE	BLUE
4	N.C	N.C
5	DDC RETURN	DDC RETURN
6	RED GROUND	RED GROUND
7	GREEN GROUND	GREEN GROUND
8	BLUE GROUND	BLUE GROUND
9	+5	+5
10	LOGIC GROUND	LOGIC GROUND
11	N.C	N.C
12	SDA	SDA
13	H-SYNC(TTL)	(H+V) SYNC
14	V-SYNC(VCLK)	VCLK
15	SCL	SCL

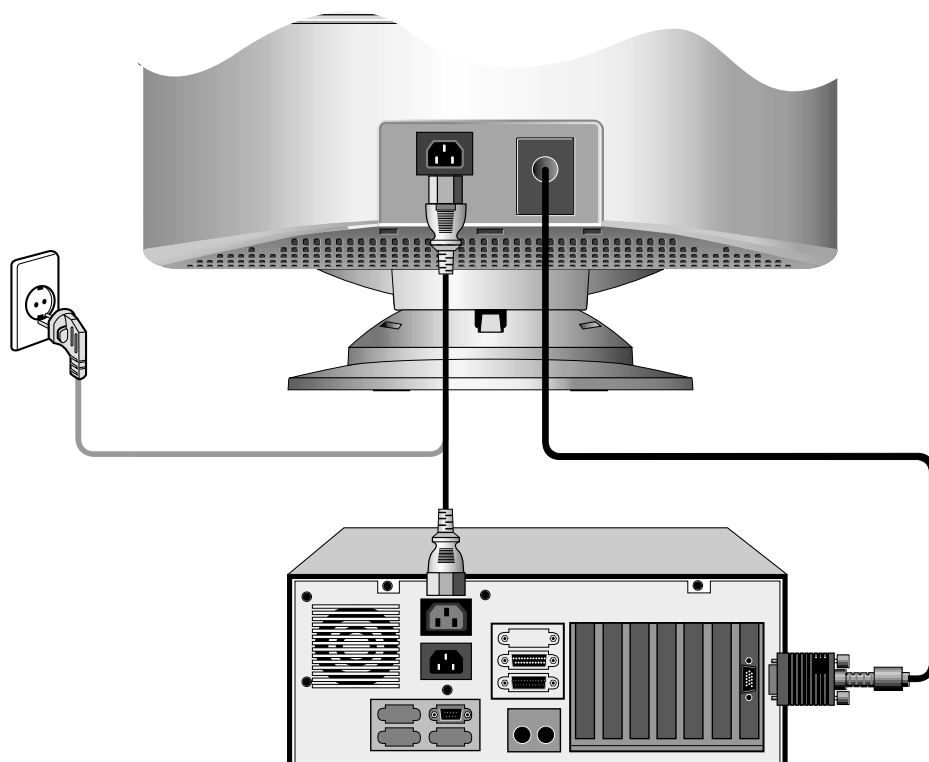
D-Sub male connector



Connecting With External Equipment

Cautions

Be sure to turn off the power of your computer before connecting the monitor.



Theory of Operation

1. Power Supply

The AC line voltage range is from 100V to 240V.

The SMPS has +55V, +7.0V, +14V, +5V, -12V

The conducted noise is filtered by X(CP01, CP04) and Y (CP02, CP03, CP32, CP33, CP09) capacitors and a common mode line filter (LP01).

The input rectifier (DP01 ~ DP04) converts the AC line voltage into a DC voltage to power the SMPS.

The UC3843B (ICP01) drives the power FET(QP04) according to the PWM signals generated by the R_T and C_T (RP07, CP10) connected pin 4 of ICP01.

The ICP01 is an integrated current mode PWM.

It consists of an oscillator, error amplifier, current sense comparator, under voltage lock-out and an MOSFET drive stage.

The switching frequency is locked to horizontal scan frequency by horizontal flyback pulse.

When the monitor is in Stage2 with no pulsed syncs. QP05 and QP07 is turned off. The total power consumption must be less than 5W in Stage2.

2. DPMS and Self test mode

The power supply supports the DPMS function. Its operation is shown in the table below.

MODE	H-SYNC	V-SYNC	MCU PIN35 (BRI)	MCU PIN 10 (Suspend)	Q905 QP07	14V	HEATER
Stage1	O	O	CONTROL	H	ON	14V	6.3V
Stage2	X	O	0	L	OFF	0V	2V
	O	X					
	X	X					
Self Test	X	X	3.5V	H	ON	14V	6.3V

3. Signal Processing and MCU Control

The X-TAL resonates at 12MHz.

When the H and V sync or TTL composite sync are input to MCU, MCU can measure the H and V frequency to detect the video mode.

MCU has digital to analog converter(DACS) control function like ABL, H-LIN, SBU-SIZE, rotation, brightness, and MCU can control, Recall, H/V-Size, H/V-Position, Pincushion/Trapezoid, Top/Bottom-Corner, H/V-Linearity, Parallel/Pin Balance, H/V Moire, Color Control, Information, Language, by I2C BUS Line.

The operation of MCU is shown in the table below.

H-FREQ (kHz)	H-LIN1 PIN 30	H-LIN2 PIN 29	H-LIN3 PIN 28	REMARK
31 < H < 34	L	L	L	
34 < H < 36	L	L	H	
36.0 < H < 41	L	H	H	
41.0 < H < 46	L	H	H	
46 < H < 52	H	L	L	
52 < H < 59	H	L	H	
59 < H < 62	H	H	L	
62.0 < H < 66	H	H	L	
66.0 < H < 69	H	H	H	

4. Horizontal Deflection

TDA9116 is an I2C autosync deflection controller for H/V sync and drive processing.

All functions are controlled by I2C bus.

When H-Sync is applied, the internal oscillator is automatically locked.

The duty-cycle of H-output pulse Pin 26 is variable by frequency.

QH08 and TH01 are used to drive the H-output transistor (QH09). QH09 is turned on, it conducts current through the deflection yoke on the right hand side of the screen.

This current comes from the S correction capacitors (CH27, CH29, CH32, CH34), which have a charge equal to the effective supply voltage.

When the QH09 is opened up, the damper diode (DH12) allows current for left hand side of the screen to flow back through the deflection yoke to the S capacitors.

The flyback capacitor (CH23) determines the size and length of the flyback pulse.

The S capacitors correct outside versus center linearity in horizontal scan.

THREE FETs (QH11, QH12, QH13) select the value of S capacitors.

H-centering is controlled by a switch (SWH01). The switch selects DC offset current flow through the yoke.

A diode modulator is used to control the E-W correction and H-size. ICH01 generates the E-W parabola wave using vertical amp.

A power buffer (QH02, QH03) drives the diode modulator.

In order to keep the high voltage constant independent of the horizontal scan frequency, the supply voltage of FBT must increase with increasing scan frequency proportionally. A step-up mode DC-DC converter with PWM is used to realize this demand.

ICH01 compares high-voltage feedback with reference voltage. Its output pulse switches a FET (QH07). To adjust the high voltage, TDA9116 (ICH01) has a control terminal (Pin14).

5. Vertical Deflection

In vertical section of TDA9116 there is auto-sync processing.

The vertical output stage consists of a power OP-AMP with extra flyback generator.

TDA9302H (ICV01) is used as vertical output stage.

6. X-Ray Protection and Beam Current Limiting.

A failure in the horizontal scan control section could cause a dangerous situation; the high voltage might rise to an unacceptable high level. When the flyback voltage rise to unacceptable level, the (Pin25) of ICH01 detects these states over 8.0V TDA9116

It causes the H-drive stage and oscillator to be turned off. Then high voltage is shut down until the power switch is on.

The average anode current is measured at lower side of the High Voltage winding of the FBT.

ABL flows through Connectors (CNM06, CNC01) connected ICC01 (LM1267) and through RM07 Connected ICM01 Pin39. and ABL is controlled by ICM01.

7. Video Amplifier and OSD Interface

LM1267 (ICC01) is a Very High Frequency video amplifier with three matched video amplifiers, OSD Contrast Control SDA, SCL, OSD Interface, OSD BLK drive controls, blanking gate and clamp gate. H-blank signal is applied to Pin 24. During blanking all three outputs are thrown to the pedestal level. MCU (ICM01) Pin32 Clamp is used to a clamp signal.

The signal is applied to ICC01 Pin 23.

Three OSD inputs (Pin 1,2,3 of ICC01) are TTL compatible and typical bandwidth is 80MHz.

A fast commutate pin is provided to select either the video or the OSD inputs as a source for amplification.

gain of three internal variable gain amplifiers through the I2C bus interface. MTV 021 is designed for monitor application to display built-in characters or fonts on to monitor screen.

The display operation occurs by transferring data and control information from the MCU to RAM through a serial data interface.

The output stage is made of 3-channel power amplifier (LM2467, ICC03). The output is capable of 40 Volts swing in less than 9 nsec.

The three cathodes are AC coupled to the video amplifiers. The DC level on each cathode is set by a cut-off amplifier and clamp diode. The value of the DC voltage is adjusted by DACS.

Visual Characteristics

1. Test condition

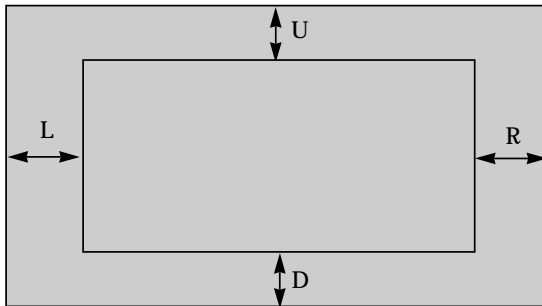
- Resolution : Any of Preset modes
- Input level : 700mV
- Pattern : Central White box covering 20% of the data area
- Brightness Control : Default position (cut off)
- Contrast Control : Adjust to 100 cd/m² of luminance (Center of the white field)
- Image duty cycle : 10% to 90%
- Magentic field : Horizontal = 0.3 Gauss
Vertical = 0.4 Gauss
- Supply Voltage : 100 ~ 240 VAC
- Operating Condition
 - Temperature (0 to 35)°C
 - Humidity (35 to 80)% (W/O condensation)
 - Altitude (0 to 3000)m
- Stroage condition
 - Temperature (-20 to 60)°C
 - Humidity (5 to 85)% (W/O condensation)
 - Altitude (0 to 15,000)m

2. Display Centering

The following describes the pattern for this test. Basically it is composed by a single pixel white line around the perimeter of the data area, with marks for the horizontal and vertical axes, the background is black.

The display centering shall be met as following specification at adjusted centering function (user's control)

$$[L-R] \leq 4\text{mm} \quad [U-D] \leq 4\text{mm}$$

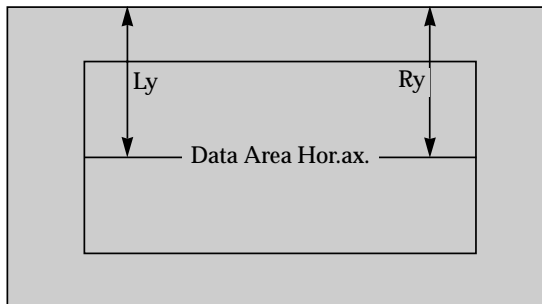


Display Cextering

3. Tilt

The maximum variation of the display rotation(tilt) shall be with in 2.0mm based on the following formula.

$$[Ly-Ry] \leq 2.0\text{mm}$$

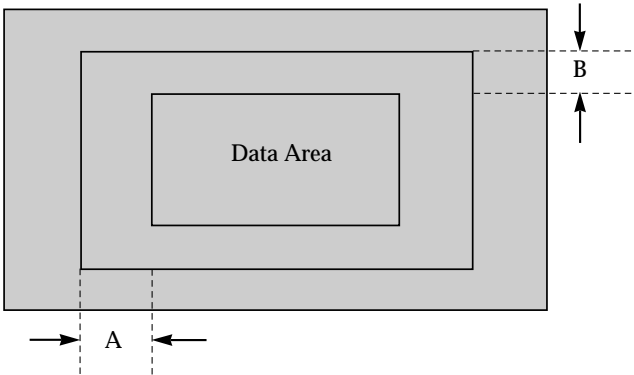


4. Geometric Distortion

All kind of Geometric Distortion (Pincushion, Barallel, Parallelogram and Trapezoid) shall be with in 2mm boundary (to tolerance frame) Refer to belows tolerance frame.

$A \leq 2\text{mm}$ $B \leq 2\text{mm}$

The tolerance frame sides are parallel to the window of enclosure axes.



5. Linearity

The linearity of an image displayed on the CRT must meet the following requirements, with reference to figure for both X and Y axis.

	X1	X16
Y1										
.										
.										
.										
.										
.										
.										
.										
.										
Y12										

• Formula : $\frac{X_{\text{Max}} - X_{\text{Min}}}{X_{\text{Max}} + X_{\text{Min}}} \times 100 = \leq 6\%$ overall

$\frac{X_{\text{Max}} - X_{\text{Min}}}{X_{\text{Max}} + X_{\text{Min}}} \times 100 = \leq 5\%$ adjacent cells

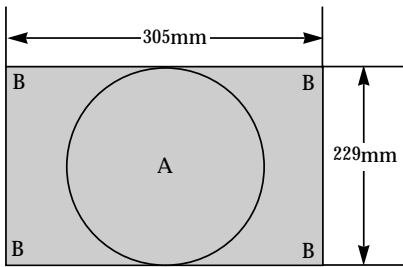
• Where : $X1 = X2 = \dots = X16$
 $Y1 = Y2 = \dots = Y12$

6. Misconvergence

The display must confirm to all following requirements:
Maximum convergence error.

MODEL	Area	Horiz. Direction	Vert. Direction
Q770	A Central circle field of (299) mm diameter	0.3mm	0.3mm
	B All screen Area (305 × 229) except Area A	0.4mm	0.4mm

The maximum convergence error shall be measures for a white spot of line, and represents the maximum distance between the energy centers of any two primary colors.



Active Area

Power Management System

The automatic power management function saves electricity and reduces heat. Used in conjunction with a PC having Power Management function, or a PC running Screen Blanking software, this monitor automatically reduces its power consumption when the PC is not in use. This monitor runs in four states: ON (Normal Operating), Stand-by (No Video Signal), Suspend (Minimum Power for Quick Recovery) and OFF (Non-Operating).

This monitor is in compliance with U.S EPA Energy Star and NUTEK requirements.

Please refer to the following specifications.

State	Signals			Power consumption	Recovery time	LED Description
	H-Sync	V-Sync	Video			
Stage1	pulses	pulses	active	70W	-	Green
Stage1	no pulse	pulses	blanked	Less than 5W	within 3 sec	Orange
	pulses	no pulse	blanked			
	no pulse	no pulse	blanked			

☞ (*) ; It is capable to select by user.

Trouble Shooting

1. Introduction

This trouble shooting guide is arranged by fault conditions. Following each fault condition is a check for a signal on condition to be answered YES or NO.

For NO answer proceed to the right and continue until the fault is located.

For a YES answer continue in the left column to the next numbered check.

Again followed this procedure until the fault is located.

2. Trouble shooting procedure

When Troubleshooting this monitor, some precaution should be observed.

Use a high quality isolation transformer is capable of providing 3 Amps or more.

Never connect primary ground and secondary ground together including use with an isolation transformer.

Measure high voltage with respect to chassing ground only, and with a high impedance prove of 1000 mega-ohm or higher and rated for 30KV DC or higher.

Measure QH09 collector pulse with a high quality 100:1 probe rated for 1500 volts or higher.

3. Troubleshooting procedure

Symptom	Check(YES)	Action(NO)
a) Image is scrolling.	1) Check for Vsync at pin 41 of ICM01 2) Check for positive going Vsync at pin 2 of ICH01. 3) Will V-oscillator is locked with input signal? (pin 22 of ICH01) 4) Check V-ramp at pin 23 of ICH01. 5) Check V-out at pin 5 of ICV01.	Check 15 pin D-sub connector, cable, ZDM02. Check ICM01, ICH01 Check CH01, CH02 Replace ICH01. Check B+ at pin 2,4 of ICV01.
b) Image is unstable.	1) Check for Hsync at pin 40 of ICM01 2) Check for positive going Hsync at pin 1 of ICH01. 3) Will H-oscillator is locked with input signal? (pin 6 of ICH01) 4) Check H-out at pin 26 of ICH01 5) Check for flyback pulse at pin 12 of ICH01.	Check 15 pin D-sub connector, cable, ZDM01. Check ICM01 , ICH01 Check CH06, RH06 Replace ICH01 Check RH10

Symptom	Check(YES)	Action(NO)
c) Screen is black but high voltage is present.	1) Check for G2, pin4 of CRT. Around 500 volts? 2) Check for heater voltage at pin 6 of CRT. (about 6.3V) 3) Can screen be lit with brightness control at MAX? 4) Check for video at pin 5, 6, 7 of ICC01 5) Check for positive pulse for clamp at pin 23 of ICC01. 6) Check if contrast controls video level at pin 18,19,20 of ICC01. 7) Check for video at pin 1, 2, 3 of ICC03. 8) Check if R, G, B cut-off control the video DC level at pin 6, 8, 11 of CRT. 9) Check CRT.	Check DH28, RH96, RH92, CH53, CRT socket. G2 Wire Check DP13, RP24, RP25, QP05 CRT socket. RC32, CNC01 Check DH21, DH25, QH18, QH19. DH26 RH99. CRT socket. Check 15 pin D-sub connector, cable, DC4,5,6 Check Check ICM01, RC13, CNC01 Check ICM01, ICC01, 5V _{DC} (Pin9) of ICC01 Check ICC03, 75V _{DC} (pin 4) 12V _{DC} (pin 8) Check ICC04
d) Screen is black with no high voltage.	1) Is the LED01 lighting in Green color. 2) Check for 14V at collector of QP07. 3) Check output pulse at pin 26, 28 of ICH01. 4) Check Hor-Drive pulse at Base of QH09. 5) Check B+ at pin 2 of TH04.	Check H.V Sync at pin40, 41 of ICM01. Check pin 8,9 of ICM01. Check ICM01, ICM02, ICC03 Check QP07, QP08. Check pin 10 of ICM01. Check for Vcc at pin 29 of ICH01. Check oscilation pulse at pin 6 of ICH01. Check X-Ray voltage below 8.0V at pin 25 of ICH01. Check RH11, RH12, RH13 Check QH08, TH01. Check DH07, LH01, QH07, QH05 QH06, RH41, RH42, RH39, RH16, ICH01
e) No power	1) Check ICP01 pin 4, 7 2) Check switch pulse at Drain of QP04. 3) Check voltage for, 55V at Cathode of Dp11 and for 7V at Cathode of DP13 and for 14V at cathode of DP15	Check QP01, QP02, DP16, DP07 Check pin 6, 3 of ICP01, RP11 Recheck above Item(d).

Adjustment Method

1. Caution

Extremely high voltage are present in the area around the FBT(TH04) and the anode high voltage Lead.

2. Equipment Required

Digital Voltmeter
Frequency Counter : about 40 Hz to 100 KHz
Color Analyzer
Video Signal Generator
High Voltmeter : up to 30 KV
Alignment Template : Attachment 1

3. Before Adjustment

Verify that the video output level is 0.7 Vpp at 75 ohm termination and the video timings are same as standard timing given in specification. Place the AC power switch to the ON position. Allow the monitor to stabilize thermally for 15 minutes at least before any adjustment about the image parameters. The electron optics of the CRT and electronics of system require time of stabilize.

4. Adjustment Procedure

4-1 Horizontal raster center setting

- Video Signal : Back Raster pattern in 60kHz, 768 mode
- Measuring Point : SWH01, main board
- Place the Raster in center of the bezel.

4-2 Factory mode setting

- Turn off the power.
- Keep pressing the menu select key until the power turns on.
- Press the menu select key one more time.
- You can see the "F" message in 5th bottom on the right of the OSD main menu.
- This is the factory mode.
- Turn off the power to save the adjusted state.
- Select the "Mode Information" menu after you exit the factory mode.

4-3 Rotation setting

- Video Signal : Cross Hatch pattern in 31.5kHz, 400 mode
- Adjust the rotation of screen by using the menu select key and UP And Down Key.

4-4 Color setting

- Adhere color Analyzer sensor closely to CRT center.
- Set Factory mode.
- Video mode : 68.677kHz, 768 mode

1 Color Temperature 9300°K setting

- Select "93" by using the menu select key and up/down KEY.

① Back Raster Setting

- Video signal : Back Raster Pattern
- Adjust the brightness of back raster by Using up/down KEY in "Bright"
- Limits : $2.5 \pm 0.5 \text{ cd/m}^2$

② Cut-off Setting

- Video signal : Back Raster Pattern
- Select "Cut-off" by using the menu select key and adjustment up/down KEY.
- Press the menu select key to get the desired R, G or B Cut-off.
- Adjust x and y color coordinate by Using up and down key
- Limits : $x=0.283 \pm 0.01$, $y=0.297 \pm 0.01$

③ Drive Setting

- Video signal : 20% white box
- Select the "9300" by using the menu select key and R,G or B up/down KEY.
- Press the menu select key to get the desired R or B
- Adjust the x and y color coordinate by Using up and down key
- Limits : $x=0.283 \pm 0.01$, $y=0.297 \pm 0.01$

④ Contrast Setting

- Video Signal : 20% white box
- Adjust the brightness go to 0.1 cd/m^2 by using the adjustment up/down KEY in "Bright"
- Adjust the brightness of 20% white box by using up/down Key in "contrast"
- Limits : $150 \pm 3 \text{ cd/m}^2$

⑤ Back Raster Setting again

- The method of adjustment is same to section ①

2) Color Temperature 6500°K Setting

- Select "65" by using the menu select key and up/down KEY.

① Back Raster, Cut-off Setting

- The method of adjustment is same to 9300°K
- The color coordinate is $x=0.313 \pm 0.01$, $y=0.329 \pm 0.01$

② Drive, contrast Setting

- The method of adjustment is same to 9300°K
- The color coordinate is $x=0.313 \pm 0.01$, $y=0.329 \pm 0.01$

4-5 Geometry Setting

- Adhere template closely to the CRT surface
- Video Signal : Cross hatch pattern in 31.5kHz to 69kHz expectively.
- Adjust the all items by using the menu/select key .

1) Horizontal Position Setting

- Place the screen in center of the horizontal direction.

2) Horizontal Size Setting

- Adjust the horizontal size of the screen to $305 \pm 5 \text{ mm}$
- adjust the horizontal size of the screen to $260 \pm 4 \text{ mm}$.

3) Vertical Position Setting

- "Place the screen in center of the vertical direction.

4) Vertical Size Setting

- Adjust the vertical size of the screen to $229 \pm 5 \text{ mm}$

5) Pincushion Setting

- Make the straight line to the vertical right and left line of screen.

6) Trapezoid Setting

- Make the same size to the horizontal up and bottom size of screen.

7) Parallelogram & Pin Balance

- Adjust parallelogram until vertical lines are parallel to the vertical vezel.

8) Corner Pin

- Adjust corner pin until 4 corners are parallel to the vertical vezel.

9) Rotation Setting

- Adjust rotate until horizontal lines are parallel to the vezel.

4-6 Focus

- Video Signal : Reverse " Full H " character pattern in 64kHz 1024 mode
- Adjust H/V Focus VR on the top and middle of the FBT so that the image of whole screen looks clear

5. X-Ray Protection Test

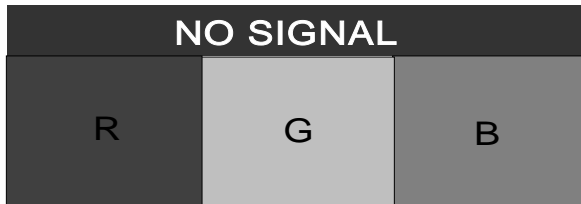
- In any signal input condition, short RH12 (main board) by using the JIG.
- At this moment, check out whether raster disappears.
- Remove the JIG.
- After the power switch of the set off and on, check out proper working

6. AGING and Self Test Mode

The monitor has an enhanced level of self-diagnostics.

When the signal cable is removed The monitor is operated to self test mode(Following OSD Image) and The Signal Isn't detected, the monitor is operated to OFF-Mode.

Picture A (MODE FOR END USER)



(OSD MESSAGE is moving around the screen)

Specification

CRT	SIZE	17"(16" viewable) Diagonal
	Dot Pitch	0.20 mm (Horizontal Dot Pitch)
	Type	Non-glare, Anti-Static & TCO Coated
Input	Signal	R.G.B Analog
	Cable	15 pin D-Type male Connector
SYNC	H-F	30 kHz ~ 70 kHz(Automatic)
	V-F	50 Hz ~ 150 Hz(Automatic)
Video Bandwidth		108 MHz (-3dB)
Display	Area(H×V) Color	305 × 229mm (Max. Over Scan) Infinite
Resolution	Max.	1280 × 1024(64kHz/60Hz)
User Controls & OSD Controls		Recall, Brightness/Contrast, H/V-Position, H/V-Size, Pincushion/Trapezoid, Rotation, H/V-Moire, Degauss, Color Control, Parallel, Information, Language, OSD H/V Poistion, Pin Balpance, Top/Botton-Corner, H/V-Linearity
Power Management		As per VESA Standard, Lower than EPA's recommendation
VESA DDC 1/2B		Basic
Compatibility		VESA, 8514/A, XGA, EVGA, MAC II
Power Source		100-240 VAC(Universal Power) 70W 1.5A
Safety & Regulation	TCO	Basic
	EMC	FCC Class B, CE,EMC
	Safety	cULus, TÜV-GS, SEMKO, DHHS, PCBC, GOST-R, VCCI
Temperature	Storage	-20 to 60 degree celsius
	Operating	0 to 35 degree celsius
Humidity	Operating	35% to 80% (Non-condensing)
	Storage	5% to 85%
Weight		Unit : 15.5Kg • Gross Weight :17.5Kg(with carton)
Dimension(W × H × D mm)		380 × 372 × 411mm

►Specification is subject to change without notice for performance improvement.

Critical Parts Specification

WT62P1

GENERAL DESCRIPTION

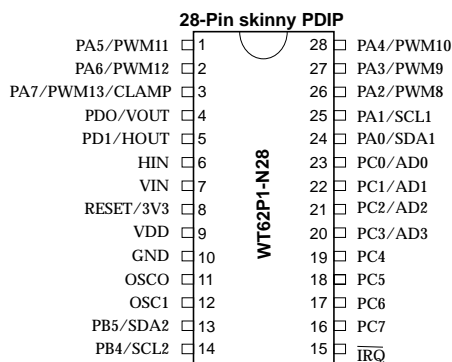
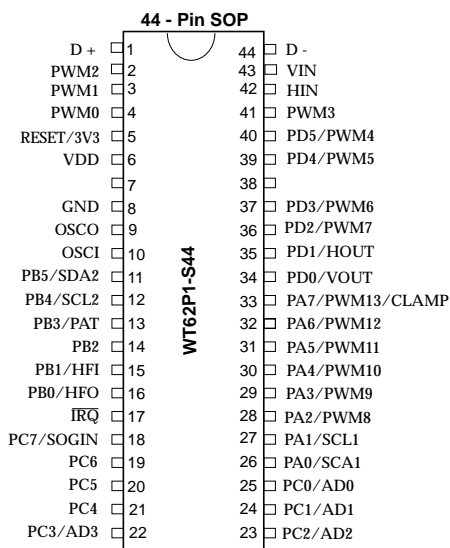
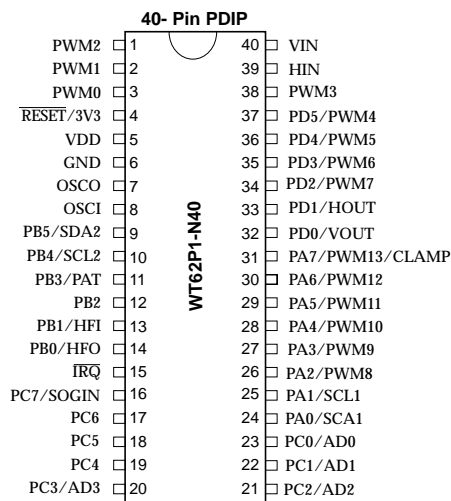
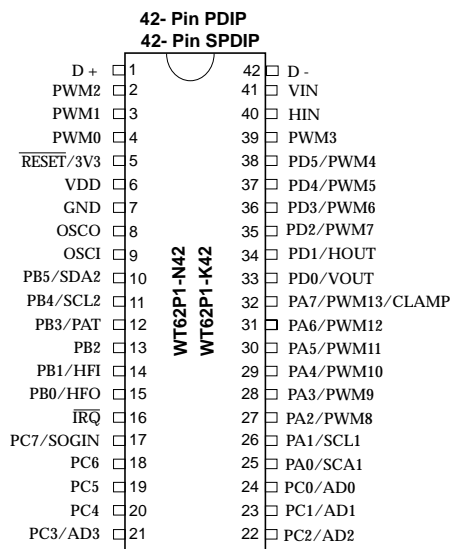
The WT62P1 is a microcontroller for digital controlled monitor with Universal Serial Bus(USB)interface. It contains an 8-bit CPU, 32k bytes flash memory, 512 bytes RAM, 14 PWMs, parallel I/Os, SYNC signal processor, time, DDC 1/2B interface, master/slave I2C interface, low speed USB device module, 6-bit A/D converter and watch-dog timer.

FEATURES

- 8-bit 6502 compatible CPU with 6MHz operating frequency
- 32768 bytes flash memory, 512 bytes SRAM.
- 12 MHz crystal oscillator
- 4 channels processor with H+V separation , H/V frequency counter, H/V polarity detection/control and clamp pulse output
- Sync signal processor with H+V separation, H/V frequency counter, H/V polarity detection/control and clamp pulse output
- Six free-running sync signal outputs(Horizontal frequency up to 106KHz)
- Self-test pattern
- DDC 1/2B supported
- Fast mode master slave I²C interface(up to 400KHz)
- Embedded USB function with endpoint 0 and endpoint 1
- Built-In 3.3V regulator for USB transceiver
- Watch-dog timer
- Maximum 28 programmable I/O pins
- One 8-bit programmable timer
- 6-bit A/D converter with 4 selectable inputs
- One external interrupt request input
- Low V_{DD} reset

Package Type	Part Number
42-pin PDIP	WT62P1-N42
42-pin shrink PDIP	WT62P1-K42
40-pin PDIP	WT62P1-N40
28-pin skinny PDIP	WT62P1-N28
44-pin SOP	WT62P1-S44

PIN CONFIGURATION



TDA9116**FEATURES****General**

- ADVANCED I²C BUS CONTROLLED DEFLECTION PROCESSOR DEDICATED FOR HIGH-END CRT MONITORS
- SINGLE SUPPLY VOLTAGE 12V
- VERY LOW JITTER
- DC/DC CONVERTER CONTROLLER
- ADVANCED EW DRIVE
- ADVANCED ASYMMETRY CORRECTIONS
- AUTOMATIC MULTISTANDARD SYNCHRONIZATION
- VERTICAL DYNAMIC CORRECTION WAVEFORM OUTPUT
- X-RAY PROTECTION AND SOFT-START & STOP ON HORIZONTAL AND DC/DC DRIVE OUTPUTS
- I²C BUS STATUS REGISTER

Horizontal section

- 150 kHz maximum frequency
- Corrections of geometric asymmetry: Pin cushion asymmetry, Parallelogram
- Tracking of asymmetry corrections with vertical size and position
Fully integrated internal horizontal moiré cancellation and moiré cancellation output

Vertical section

- 200 Hz maximum frequency
- Vertical ramp for DC-coupled output stage with adjustments of: C-correction, S-correction for super-flat CRT, Vertical size, Vertical position
- Vertical moiré cancellation through vertical ramp waveform
Compensation of vertical breathing with EHT variation

EW section

- Symmetrical geometry corrections: Pin cushion, Keystone, Top/Bottom corners separately
Horizontal size adjustment
- Tracking of EW waveform with Vertical size and position and adaptation to frequency
- Compensation of horizontal breathing through EW waveform

Dynamic correction section

- Output with vertical dynamic correction waveform for dynamic corrections like focus, brightness uniformity, ...
- Fixed on screen by means of tracking system

DC/DC controller section

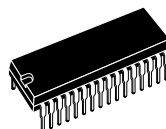
- Step-up and step-down conversion modes
- External sawtooth configuration
- Bus-controlled output voltage
- Synchronization on hor. frequency with phase selection
- Selectable polarity of drive signal

DESCRIPTION

The TDA9116 is a monolithic integrated circuit assembled in a 32-pin shrink dual-in-line plastic package. This IC controls all the functions related to horizontal and vertical deflection in multimode or multi-frequency computer display monitors.

The internal sync processor, combined with the powerful geometry correction block, makes the TDA9116 suitable for very high performance monitors, using few external components.

Combined with other ST components dedicated for CRT monitors (microcontroller, video preamplifier, video amplifier, OSD controller) the TDA9116 allows fully I²C bus-controlled computer display monitors to be built with a reduced number of external components.

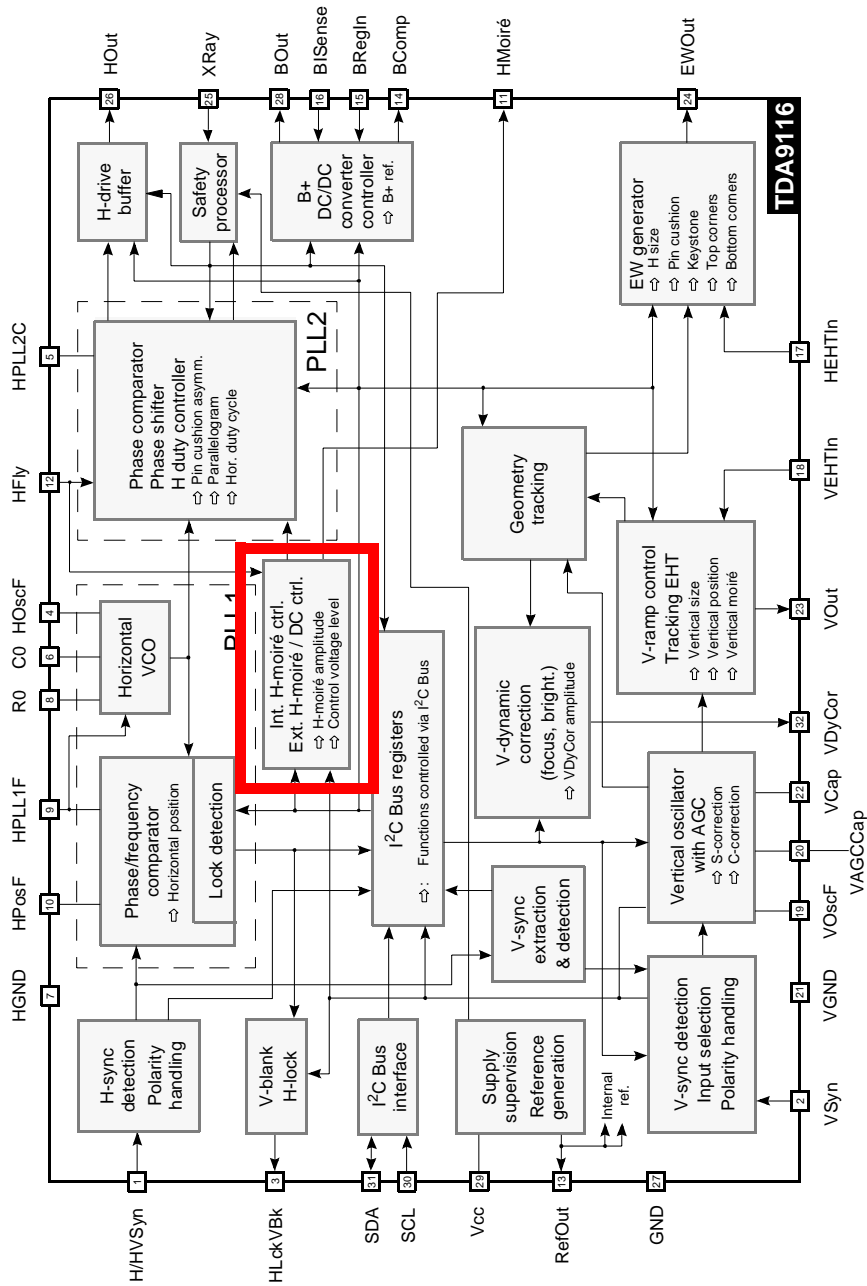


SHRINK 32 (Plastic Package)
ORDER CODE: TDA9116

2 - PIN CONFIGURATION

H/HVSyn	<input type="checkbox"/>	1	32	<input type="checkbox"/>	VDyCor
VSyn	<input type="checkbox"/>	2	31	<input type="checkbox"/>	SDA
HLckVBk	<input type="checkbox"/>	3	30	<input type="checkbox"/>	SCL
HOscF	<input type="checkbox"/>	4	29	<input type="checkbox"/>	Vcc
HPLL2C	<input type="checkbox"/>	5	28	<input type="checkbox"/>	BOut
CO	<input type="checkbox"/>	6	27	<input type="checkbox"/>	GND
HGND	<input type="checkbox"/>	7	26	<input type="checkbox"/>	HOOut
RO	<input type="checkbox"/>	8	25	<input type="checkbox"/>	XRy
HPLL1F	<input type="checkbox"/>	9	24	<input type="checkbox"/>	EWOut
HPosF	<input type="checkbox"/>	10	23	<input type="checkbox"/>	VOut
HMoire	<input type="checkbox"/>	11	22	<input type="checkbox"/>	VCap
HFly	<input type="checkbox"/>	12	21	<input type="checkbox"/>	VGND
RefOut	<input type="checkbox"/>	13	20	<input type="checkbox"/>	VAGCCap
BComp	<input type="checkbox"/>	14	19	<input type="checkbox"/>	VOscF
BRegIn	<input type="checkbox"/>	15	18	<input type="checkbox"/>	VEHTIn
BISense	<input type="checkbox"/>	16	17	<input type="checkbox"/>	HEHTIn

3 - BLOCK DIAGRAM



4 - PIN FUNCTION REFERENCE

Pin	Name	Function
1	H/HVSYn	TTL compatible H orizontal / H orizontal and V ertical S ync. input
2	VSyn	TTL compatible V ertical S ync. input
3	HLckVBk	H orizontal PLL1 L ock detection and V ertical early B lanking composite output
4	HOscF	High H orizontal O scillator sawtooth threshold level F ilter input
5	HPLL2C	H orizontal P LL2 loop C apacitive filter input
6	CO	Horizontal O scillator C apacitor input
7	HGND	H orizontal section G rou N D
8	RO	Horizontal O scillator R esistor input
9	HPLL1F	Horizontal P LL1 loop F ilter input
10	HPosF	Horizontal P osition F ilter and soft-start time constant capacitor input
11	HMoire	Horizontal M oiré / adjustable DC voltage output
12	HFly	Horizontal F lyback input
13	RefOut	R eference voltage O utput
14	BComp	B + DC/DC error amplifier (C omparator) output
15	BRegIn	R egulation feedback I nput of the B + DC/DC converter controller
16	BISense	B + DC/DC converter current (I) S ense input
17	HEHTIn	I nput for compensation of H orizontal amplitude versus E HT variation
18	VEHTIn	I nput for compensation of V ertical amplitude versus E HT variation
19	VOscF	V ertical O scillator sawtooth low threshold F ilter (capacitor to be connected to VGND)
20	VAGCCap	Input for storage C apacitor for A utomatic G ain C ontrol loop in V ertical oscillator
21	VGND	V ertical section G rou N D
22	VCap	Vertical sawtooth generator C apacitor
23	VOut	V ertical deflection drive O utput for a DC-coupled output stage
24	EWOut	E /W O utput
25	XRay	X - R ay protection input
26	HOut	H orizontal drive O utput
27	GND	Main G rou N D
28	BOut	B + DC/DC converter controller O utput
29	Vcc	Supply voltage
30	SCL	I ² C bus S erial C Lock I nput
31	SDA	I ² C bus S erial D Ata input/output
32	VDyCor	Vertical D ynamic C orrection output

5 - QUICK REFERENCE DATA

Characteristic	Value	Unit
General		
Package	SDIP 32	
Supply voltage	12	V
Supply current	65	mA
Application category	Mid-range	
Means of control/Maximum clock frequency	I ² C bus/400	kHz
EW drive	Yes	
DC/DC converter controller	Yes	
Adjustable DC level output	Yes	
Horizontal section		
Frequency range	15 to 150	kHz
Autosync frequency ratio (can be enlarged in application)	4.5	
Positive/Negative polarity of horizontal sync signal/Automatic adaptation	Yes/Yes/Yes	
Duty cycle range of the drive signal	30 to 65	%
Position adjustment range with respect to H period	±10	%
Soft start/Soft stop feature	Yes/Yes	
Hardware/Software PLL lock indication	Yes/Yes	
Parallelogram	Yes	
Pin cushion asymmetry correction (also called Side pin balance)	Yes	
Top/Bottom/Common corner asymmetry correction	No/No/No	
Tracking of asymmetry corrections with vertical size & position	Yes	
Horizontal moiré cancellation (int./ext.) for Combined/Separated architecture	Yes/Yes	
Vertical section		
Frequency range	35 to 200	Hz
Autosync frequency range (150nF at VCap and 470nF at VAGCCap)	50 to 180	Hz
Positive/Negative polarity of vertical sync signal/Automatic adaptation	Yes/Yes/Yes	
S-correction/C-correction/Super-flat tube characteristic	Yes/Yes/Yes	
Vertical size/Vertical position adjustment	Yes/Yes	
Vertical moiré cancellation (internal)	Yes	
Vertical breathing compensation	Yes	
EW section		
Pin cushion correction	Yes	
Keystone correction	Yes	
Top/Bottom/Common corner correction	Yes/Yes/No	
Horizontal size adjustment	Yes	
Tracking of EW waveform with Frequency/Vertical size & position	Yes/Yes	
Breathing compensation on EW waveform	Yes	
Dynamic correction section (dyn. focus, dyn. brightness,...)		
Vertical dynamic correction output	Yes	
Horizontal dynamic correction output	No	
Composite HV dynamic correction output	No	
Tracking of vertical waveform with V. size & position	Yes	
DC/DC controller section		
Step-up/Step-down conversion mode	Yes/Yes	
Internal/External sawtooth configuration	No/Yes	
Bus-controlled output voltage	Yes	
Soft start/Soft stop feature	Yes/Yes	
Positive(N-MOS)/Negative(P-MOS) polarity of BOut signal	Yes/Yes	

LM2467

Monolithic Triple 7.5 ns CRT Driver

General Description

The LM2467 is an integrated high voltage CRT driver circuit designed for use in color monitor applications. The IC contains three high input impedance, wide band amplifiers which directly drive the RGB cathodes of a CRT. Each channel has its gain internally set to ,20 and can drive CRT capacitive loads as well as resistive loads present in other applications, limited only by the package's power dissipation. The IC is packaged in an industry standard 9-lead TO-220 molded plastic power package. See Thermal Considerations section.

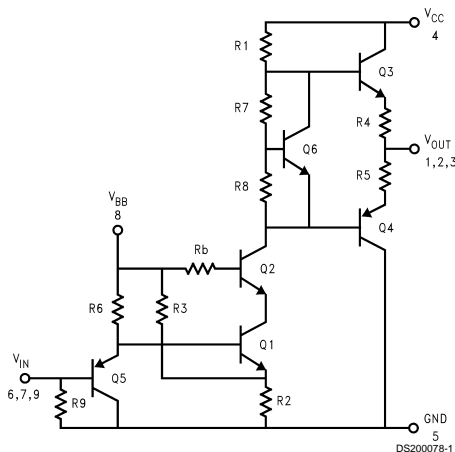
Features

- Higher gain to match LM126X CMOS preamplifiers
- 0V to 3.75V input range
- Stable with 0±20 pF capacitive loads and inductive peaking networks
- Convenient TO-220 staggered lead package style
- Maintains standard LM243X Family pinout which is designed for easy PCB layout

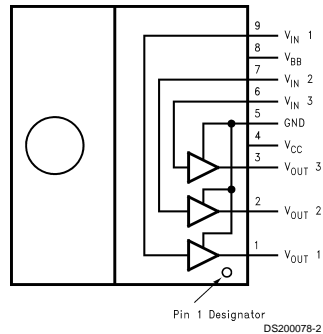
Applications

- 024 x 768 displays up to 85 Hz refresh
- Pixel clock frequencies up to 95 MHz
- Monitors using video blanking

Schematic and Connection Diagrams



**FIGURE 1. Simplified Schematic Diagram
(One Channel)**



Note: Tab is at GND

Top View
Order Number LM2467T

Absolute Maximum Ratings (Notes 1, 3)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

Supply Voltage (V_{CC})	+90V
Bias Voltage (V_{BB})	+16V
Input Voltage (V_{IN})	0V to 4.5V
Storage Temperature Range (T_{STG})	,65 C to +150 C

Lead Temperature	
(Soldering, <10 sec.)	300 C
ESD Tolerance, Human Body Model	2 kV
Machine Model	250V

Operating Ranges (Note 2)

V_{CC}	+60V to +85V
V_{BB}	+8V to +15V
V_{IN}	+0V to +3.75V
V_{OUT}	+15V to +75V
Case Temperature	,20 C to +100 C
Do not operate the part without a heat sink.	

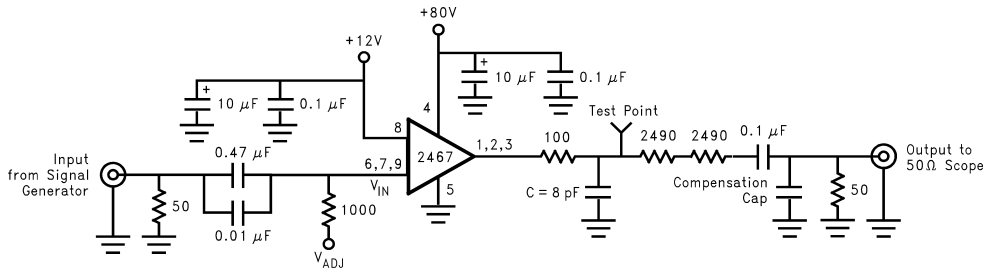
Electrical Characteristics

(See Figure 2 for Test Circuit)
Unless otherwise noted: $V_{CC} = +80V$, $V_{BB} = +12V$, $C_L = 8\text{ pF}$, $T_C = 50\text{ C}$
DC Tests: $V_{IN} = 2.25V_{DC}$
AC Tests: Output = $40V_{PP}(25V - 65V)$ at 1MHz

Symbol	Parameter	Conditions	LM2467			Units
			Min	Typical	Max	
I_{CC}	Supply Current	All Three Channels, No Input Signal, No Output Load		30		mA
I_{BB}	Bias Current	All Three Channels		18		mA
V_{OUT}	DC Output Voltage	No AC Input Signal, $V_{IN} = 1.25V$	62	65	68	V_{DC}
A_V	DC Voltage Gain	No AC Input Signal	18	20	22	
ΔA_V	Gain Matching	(Note 4), No AC Input Signal		1.0		dB
LE	Linearity Error	(Notes 4, 5), No AC Input Signal		5		%
t_R	Rise Time	(Note 6), 10% to 90%		7.5		ns
t_F	Fall Time	(Note 6), 90% to 10%		8		ns
OS	Overshoot	(Note 6)		5		%

- Note 1:** Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.
- Note 2:** Operating ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed. Some performance characteristics may change when the device is not operated under the listed test conditions.
- Note 3:** All voltages are measured with respect to GND, unless otherwise specified.
- Note 4:** Calculated value from Voltage Gain test on each channel.
- Note 5:** Linearity Error is the variation in dc gain from $V_{IN} = 1.0V$ to $V_{IN} = 3.5V$.
- Note 6:** Input from signal generator: $t_r, t_f < 1\text{ ns}$.

AC Test Circuit



DS200078-3

Note: 8 pF load includes parasitic capacitance.

FIGURE 2. Test Circuit (One Channel)

Figure 2 shows a typical test circuit for evaluation of the LM2467. This circuit is designed to allow testing of the LM2467 in a 50Ω environment without the use of an expensive FET probe. The two 2490Ω resistors form a 200:1 divider with the 50Ω resistor and the oscilloscope. A test point is included for easy use of an oscilloscope probe. The compensation capacitor is used to compensate the stray capacitance of the two 2490Ω resistors to achieve flat frequency response.

Typical Performance Characteristics ($V_{CC} = +80\text{ V}_{DC}$, $V_{BB} = +12\text{ V}_{DC}$, $C_L = 8\text{ pF}$, $V_{OUT} = 40\text{ V}_{PP}$ (25V₆₅V), Test Circuit - Figure 2 unless otherwise specified)

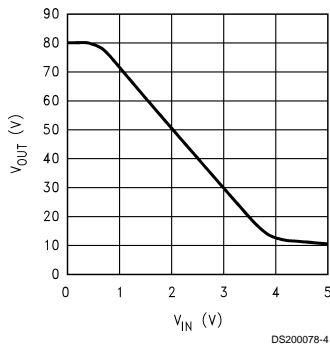


FIGURE 3. V_{OUT} vs V_{IN}

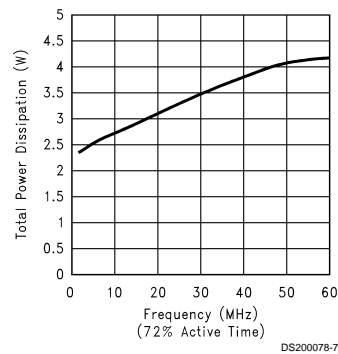


FIGURE 6. Power Dissipation vs Frequency

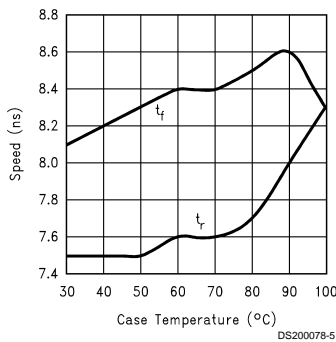


FIGURE 4. Speed vs Temp.

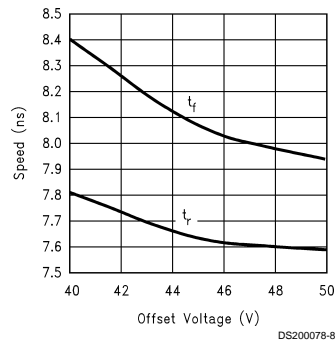


FIGURE 7. Speed vs Offset

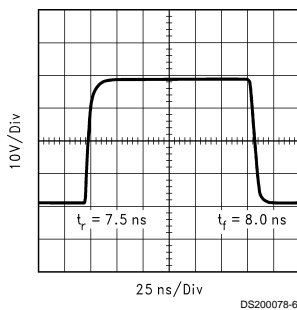


FIGURE 5. LM2467 Pulse Response

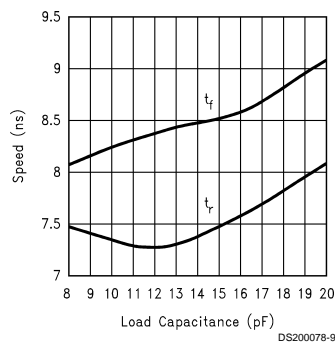


FIGURE 8. Speed vs Load Capacitance

LM2479

120V Triple Bias Clamp

General Description

The LM2479 is an integrated 120V triple bias clamp circuit for DC recovery of each of the AC coupled outputs of a CRT driver. It is well matched with the DAC outputs of the LM126X family of pre-amplifiers. Each amplifier has its gain internally set to -18. The IC is packaged in an industry standard 8 lead molded DIP package.

- High input impedance
- Single supply operation
- Matched to the LM126X family of preamplifiers

Recommended Applications

- CRT monitors requiring DC restoration at the cathodes

Features

- Wide range integrated triple bias clamp

Block Diagrams

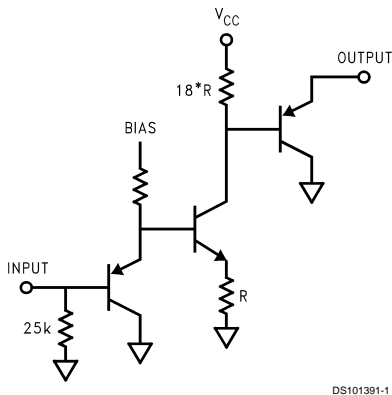


FIGURE 1. Simplified Schematic (One Channel)

Package Pinout

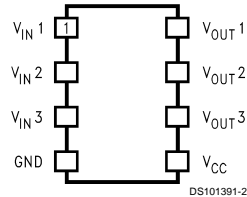


FIGURE 2. LM2479 Package Pinout
Order Number LM2479NA
NS Package Number: N08E

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

Supply Voltage, V_{CC}	+130V
Input Voltage, V_{IN}	0V to 5V
Storage Temperature Range, T_{STG}	-65 C to +150 C
Lead Temperature (Soldering, <10sec.)	300 C

ESD Tolerance, Machine Model 200V

Limits of Operating Ranges (Note 3)

V_{CC}	110 to 125
V_{OUT} , $V_{CC} = 120V$	50 to 120V
Ambient Temperature Range, T_A	0 to 70 C

DC CLAMP ELECTRICAL CHARACTERISTICS TARGETS AND LIMIT

Unless otherwise noted: $V_{CC} = +120V$, $V_{IN} = 2.25V_{DC}$, $T_A = 25\text{ C}$.

Symbol	Spec Parameter	Conditions	Min	Typ	Max	Units
I_{CC}	Supply Current	All channels		2.3	3.5	mA
V_{OUT}	DC Output Voltage		83	87	91	V_{DC}
$V_{OUT-Range}$	Output Voltage Range	V_{IN} Range = 1.0V - 4.0V		53		V
A_V	DC Voltage Gain		-16	-18	-20	
LE	Linearity Error	See Note 1		5		%
R_{IN}	Input Resistance			24K		Ω

Note 1: Linearity Error is the variation in DC gain from $V_{IN} = 1.0V$ to $V_{IN} = 4.0V$.

Note 2: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.

Note 3: Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. For guaranteed specifications and the test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed. Some performance characteristics may change when the device is not operated under the listed test conditions.

Note 4: All voltages are measured with respect to GND, unless otherwise specified.

Test Circuit

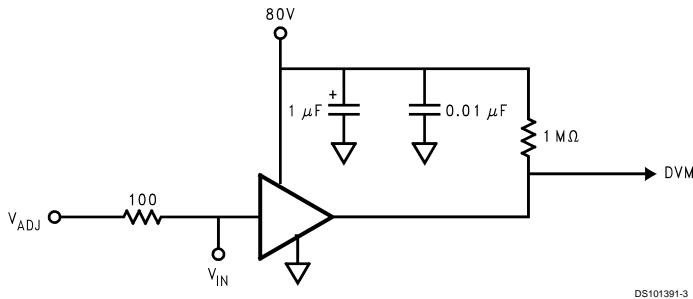
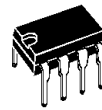


FIGURE 3. Test Circuit (One Channel)

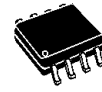
Figure 3 shows the test circuit for evaluation of the LM2479 Clamp Amplifier. A high impedance VM (>100M Ω) is used for DC measurements at the output.

UC3843B

- TRIMMED OSCILLATOR FOR PRECISE FREQUENCY CONTROL
- OSCILLATOR FREQUENCY GUARANTEED AT 250kHz
- CURRENT MODE OPERATION TO 500kHz
- AUTOMATIC FEED FORWARD COMPENSATION
- LATCHING PWM FOR CYCLE-BY-CYCLE CURRENT LIMITING
- INTERNALLY TRIMMED REFERENCE WITH UNDERVOLTAGE LOCKOUT
- HIGH CURRENT TOTEM POLE OUTPUT
- UNDERVOLTAGE LOCKOUT WITH HYSTERESIS
- LOW START-UP AND OPERATING CURRENT



Minidip



SO8

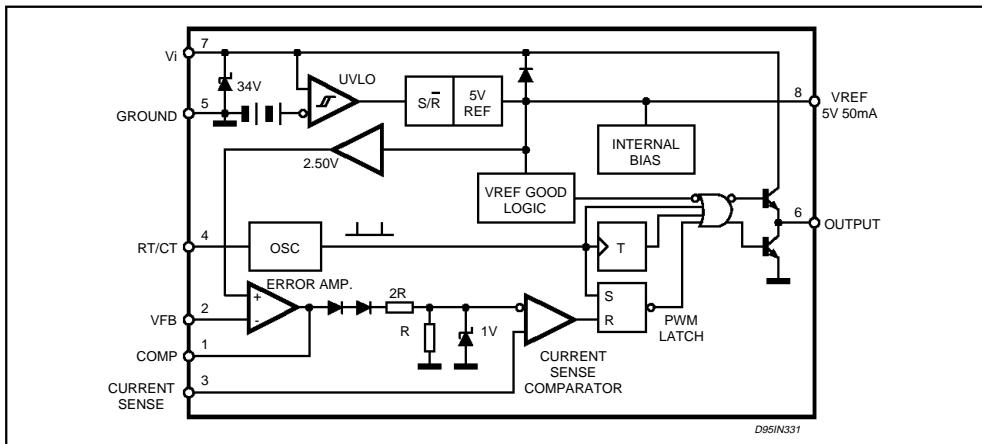
comparator which also provides current limit control, and a totem pole output stage designed to source or sink high peak current. The output stage, suitable for driving N-Channel MOSFETs, is low in the off-state.

Differences between members of this family are the under-voltage lockout thresholds and maximum duty cycle ranges. The UC3842B and UC3844B have UVLO thresholds of 16V (on) and 10V (off), ideally suited off-line applications. The corresponding thresholds for the UC3843B and UC3845B are 8.5V and 7.9V. The UC3842B and UC3843B can operate to duty cycles approaching 100%. A range of the zero to < 50 % is obtained by the UC3844B and UC3845B by the addition of an internal toggle flip flop which blanks the output off every other clock cycle.

DESCRIPTION

The UC384xB family of control ICs provides the necessary features to implement off-line or DC to DC fixed frequency current mode control schemes with a minimal external parts count. Internally implemented circuits include a trimmed oscillator for precise DUTY CYCLE CONTROL under voltage lock-out featuring start-up current less than 0.5mA, a precision reference trimmed for accuracy at the error amp input, logic to insure latched operation, a PWM

BLOCK DIAGRAM

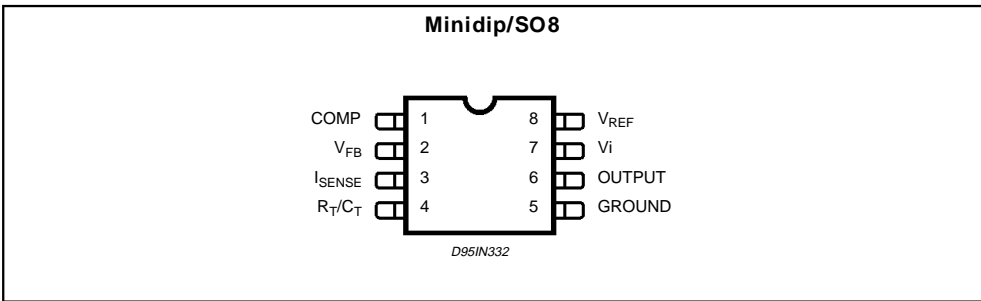


ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_i	Supply Voltage (low impedance source)	30	V
V_i	Supply Voltage ($I_i < 30\text{mA}$)	Self Limiting	
I_O	Output Current	+1	A
E_O	Output Energy (capacitive load)	5	μJ
	Analog Inputs (pins 2, 3)	± 0.3 to 5.5	V
	Error Amplifier Output Sink Current	10	mA
P_{tot}	Power Dissipation at $T_{\text{amb}} 3 25\text{ }^\circ\text{C}$ (Minidip)	1.25	W
P_{tot}	Power Dissipation at $T_{\text{amb}} 3 25\text{ }^\circ\text{C}$ (SO8)	800	mW
T_{stg}	Storage Temperature Range	± 65 to 150	$^\circ\text{C}$
T_J	Junction Operating Temperature	± 40 to 150	$^\circ\text{C}$
T_L	Lead Temperature (soldering 10s)	300	$^\circ\text{C}$

* All voltages are with respect to pin 5, all currents are positive into the specified terminal.

PIN CONNECTION (top view)



PIN FUNCTIONS

No	Function	Description
1	COMP	This pin is the Error Amplifier output and is made available for loop compensation.
2	V_{FB}	This is the inverting input of the Error Amplifier. It is normally connected to the switching power supply output through a resistor divider.
3	I_{SENSE}	A voltage proportional to inductor current is connected to this input. The PWM uses this information to terminate the output switch conduction.
4	R_T/C_T	The oscillator frequency and maximum Output duty cycle are programmed by connecting resistor R_T to V_{ref} and capacitor C_T to ground. Operation to 500kHz is possible.
5	GROUND	This pin is the combined control circuitry and power ground.
6	OUTPUT	This output directly drives the gate of a power MOSFET. Peak currents up to 1A are sourced and sunk by this pin.
7	V_{CC}	This pin is the positive supply of the control IC.
8	V_{ref}	This is the reference output. It provides charging current for capacitor C_T through resistor R_T .

ORDERING NUMBERS

SO8	Minidip
UC2842BD1; UC3842BD1	UC2842BN; UC3842BN
UC2843BD1; UC3843BD1	UC2843BN; UC3843BN
UC2844BD1; UC3844BD1	UC2844BN; UC3844BN
UC2845BD1; UC3845BD1	UC2845BN; UC3845BN

KS24C08

4K 2.5V CMOS Serial EEPROMs

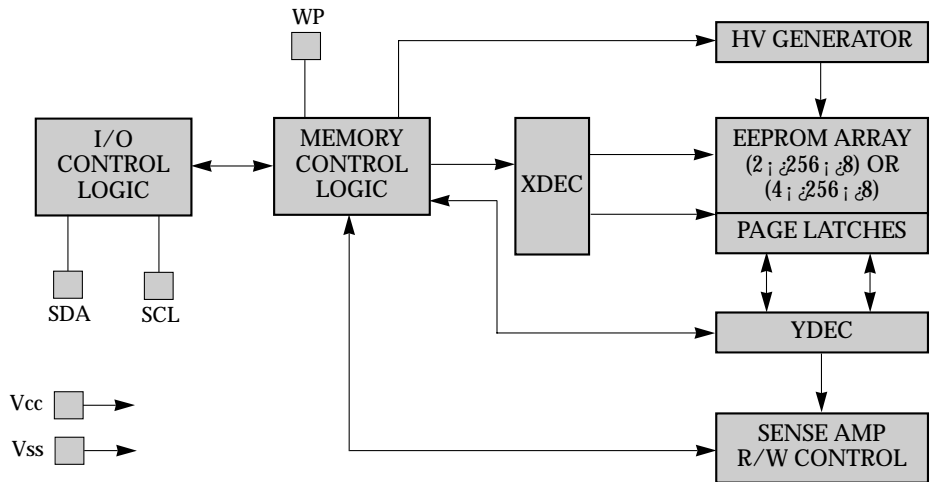
FEATURES

- Single supply with operation down to 2.5V
- Low power CMOS technology
 - 1 mA active current typical
 - 10 μ A standby current typical at 5.5V
 - 5 μ A standby current typical at 3.0V
- Organized as two or four blocks of 256 bytes
(2 \times 256 \times 8) and (4 \times 256 \times 8)
- Two wire serial interface bus, 12CTM
- Schmitt trigger, filtered inputs for noise suppression
- Output slope control to eliminate ground bounce
- 100kHz (2.5V) and 400kHz (5V) compatibility
- Self-timed write cycle (including auto-erase)
- Page-write buffer for up to 16 bytes
- 2 ms typical write cycle time for page-write
- Hardware write cycle time for page-write
- Can be operated as a serial ROM
- Factory programming (OTP) available
- ESD protection > 4,000V
- 1,000,000 ERASE/WRITE cycles (typical)
- Data retention > 40 years
- 8-pin DIP, 8-lead or 14-lead SOIC packages
- Available for extended temperature ranges
 - Commercial : 0°C to +70°C
 - Industrial : -40°C to +85°C

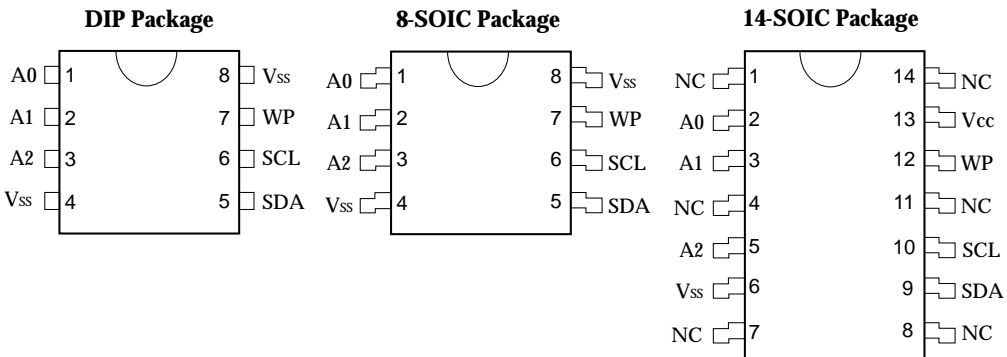
DESCRIPTION

The Microchip Technology Inc. 24LC04B/08B is a 4K-or 8K-bit Electrically Erasable PROM. The device is organized as two or four blocks of 256 \times 8 bit memory with a two wire serial interface. Low voltage design permits operation down to 2.5 volts with standby and active currents of obly 5 μ A and 1mA respectively. The 24LC04B/08B also has a page-write capability for up to 16 bytes of data. The 24LC04B/08B is available in the standard 8-pin DIP and both 8-lead and 14-lead surface mount SOIC packages.

BLOCK DIAGRAM



PIN CONFIGURATION



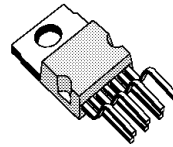
PC is a trademark of Philips Corporation

TDA9302H

- POWER AMPLIFIER
- FLYBACK GENERATOR
- THERMAL PROTECTION

DESCRIPTION

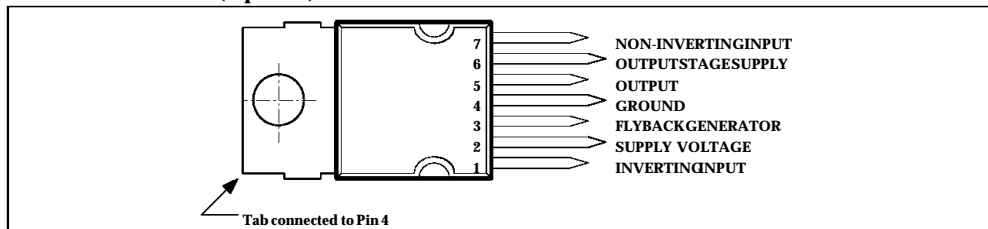
The TDA9302H is a monolithic integrated circuit in HEPTAWATT™ package. It is a high efficiency powerbooster for direct driving of vertical windings of TV yokes. It is intended for use in Color and B & W television as well as in monitors and displays.



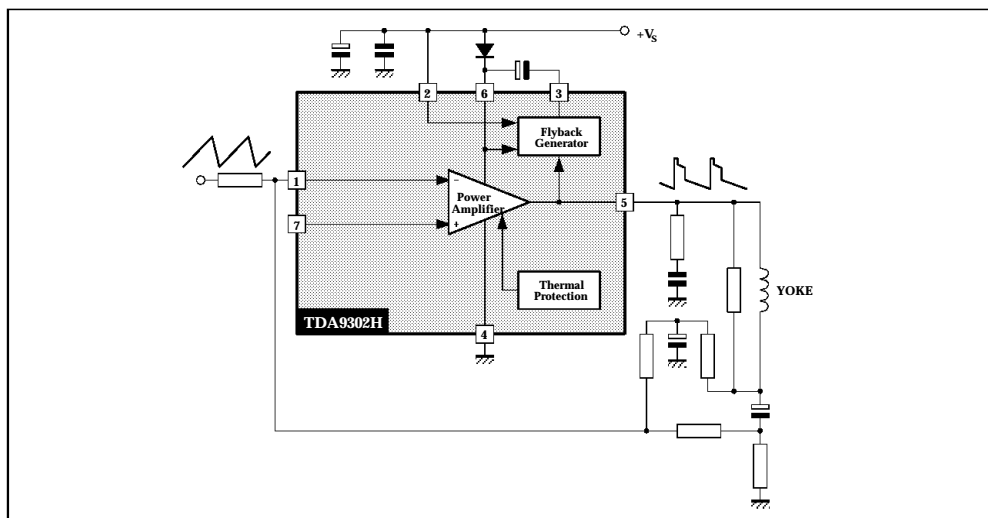
HEPTAWATT
(Plastic Package)

ORDER CODE : TDA9302H

PIN CONNECTIONS(top view)



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS AT $T_A = 25^{\circ}\text{C}$

Symbol	Parameter	Value	Unit
V_S	Supply Voltage (pin2)	35	V
V_5, V_6	Flyback Peak Voltage	60	V
V_3	Voltage at Pin3	+ V_5	
V_1, V_7	Amplifier Input Voltage	+ V_5 ± 0.5	V
I_b	Deflection Output Current	+ 1.8	A
I_3	Pin 3 DC Current at $V_5 < V_2$	100	mA
P_{tot}	Total Power Dissipation at $T_{case} = 90^{\circ}\text{C}$	15	W
T_{stg}, T_j	Storage and Junction Temperature	$\pm 40, +150$	$^{\circ}\text{C}$

CONTINUED ON NEXT PAGE

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Thermal Resistance Junction-case	Max. 4	$^{\circ}\text{C/W}$

CONTINUED ON NEXT PAGE

RECOMMENDED OPERATING CHARACTERISTICS AT $T_A = 25^{\circ}\text{C}$

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{2M}	Recommended Supply Voltage			25		V
V_{2R}	Operating Supply Voltage Range		15		30	V
I_{5PP}	Deflection Output Current				2	App

CONTINUED ON NEXT PAGE

ELECTRICAL CHARACTERISTICS

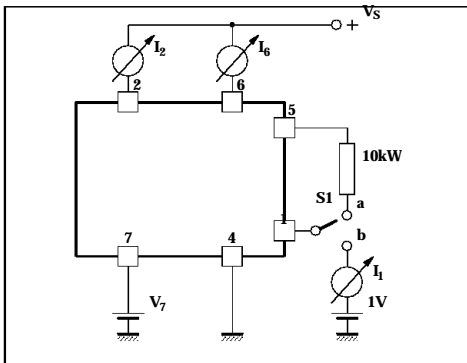
(refer to the test circuits, $V_S = 35\text{V}$, $T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
I_2	Pin 2 Quiescent Current	$I_3 = 0, I_5 = 0$			16	mA	1a
I_6	Pin 6 Quiescent Current	$I_3 = 0, I_5 = 0$			36	mA	1a
I_1	Amplifier Input Bias Current	$V_1 = 1\text{ V}, V_7 = 2\text{ V}$ $V_1 = 2\text{ V}, V_7 = 1\text{ V}$		± 0.1 ± 0.1	± 1 ± 1	mA	1a
V_{3L}	Pin 3 Saturation Voltage to GND	$I_3 = 20\text{ mA}$		1	1.5	V	1c
V_5	Quiescent Output Voltage	$V_5 = 35\text{V}, R_a = 39\text{ kW}$		18		V	1d
V_{5L}	Output Saturation Voltage to GND	$I_5 = 1\text{ A}$ $I_5 = 0.7\text{ A}$		0.9 0.7	1.3 1	V	1c
V_{5H}	Output Saturation Voltage to Supply	$\pm I_5 = 1\text{ A}$ $\pm I_5 = 0.7\text{ A}$		1.5 1.3	2 1.8	V	1b
T_j	Junction Temperature for Thermal Shut Down			140		$^{\circ}\text{C}$	

CONTINUED ON NEXT PAGE

Figure 1 : DC Test Circuits.

Figure 1 a : Measurement of I_1 ; I_2 ; I_6



S_1 : (a) I_2 and I_6 ; (b) I_1

Figure 1 b : Measurement of V_{5H}

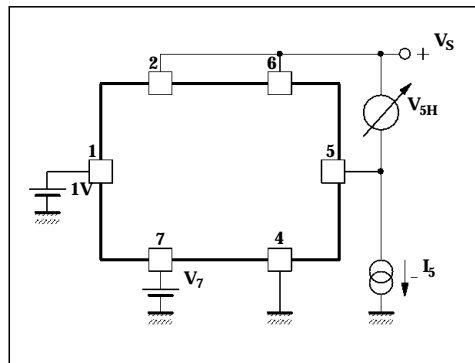
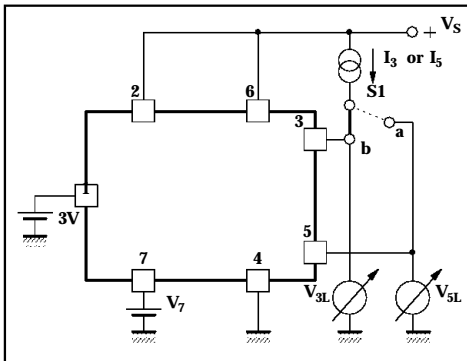
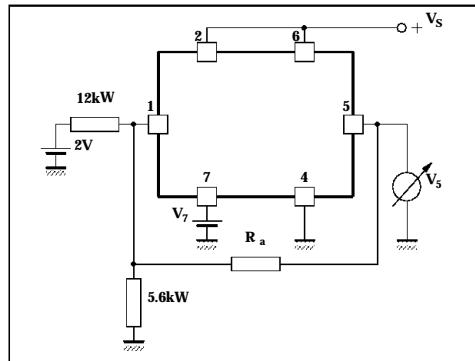


Figure 1 c : Measurement of V_{3L} ; V_{5L}

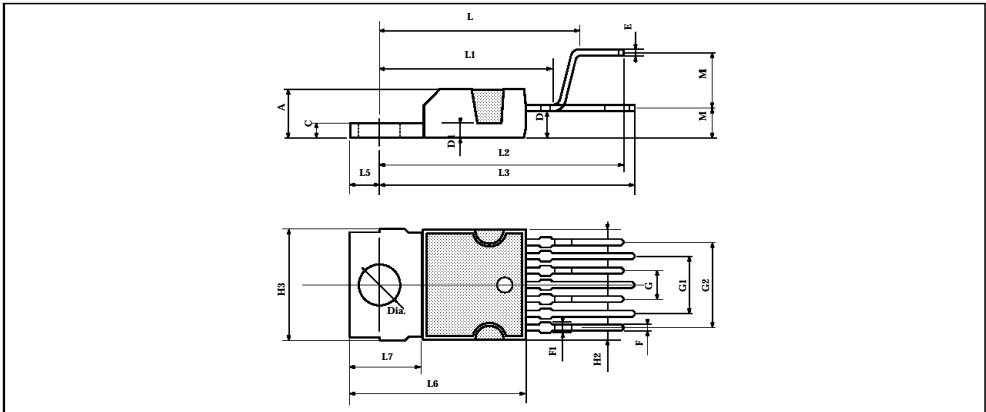


S_1 : (a) V_{3L} ; (b) V_{5L}

Figure 1 d : Measurement of V_5



PACKAGE MECHANICAL DATA : 9 PINS- PLASTIC HEPTAWATT



NOT A STANDARD / PAKET

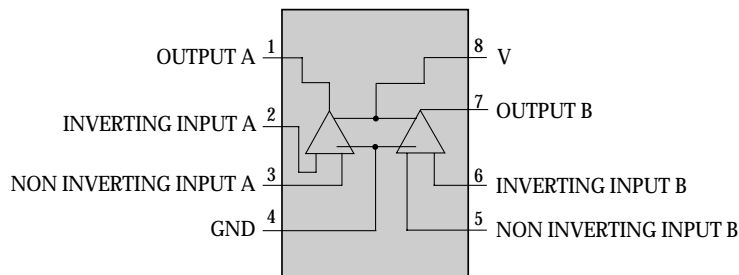
Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		16.97			0.668	
L1		14.92			0.587	
L2		21.54			0.848	
L3		22.62			0.891	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		2.8			0.110	
M1		5.08			0.200	
Dia.	3.65		3.85	0.144		0.152

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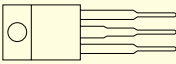
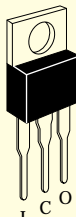
LM358



Voltage Detector ICs

Type No.	Function	Operating Voltage (V)	Package
KIA7019P/F ~7045P/F	CPU Reset, Low Voltage Detector	1.9 ~ 4.5	TO - 92 
KIA7419P/F ~7445P/F	CPU Reset, High Voltage Detector	1.9 ~ 4.5	

Voltage Regulator ICs

Type No.	Function	Typ Vo(V)	Max.			Package
			Io(A)	Vin(V)	Pd(W)	
KIA7805P/PI	1.0A 3-Terminal Regulator	5	1.0	35	20.8	 TO-220AB
KIA7806P/PI		6				
KIA7808P/PI		8				
KIA7809P/PI		9				
KIA7810P/PI		10				
KIA7812P/PI		12				
KIA7815P/PI		15				
KIA7818P/PI		18				
KIA7820P/PI		20	40	40		 I C O
KIA7824P/PI		24				

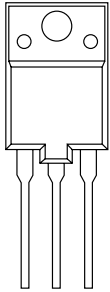
TT2062

**Horizontal Deflection Output For High Resolution Display, Color TV
High Speed Switching Applications**

- High Voltage : $V_{CBO}=1500V$
- Low Saturation Voltage : $V_{CE(sat)}=3V(\text{Max.})$
- High Speed : $t_f=0.2\mu s(\text{Typ.})$
- Collector Metal (Fin) is Fully covered with Mold Resin

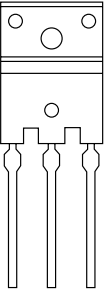
Maximum Ratings ($T_a=25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	1500	V
Collector-Emitter Voltage		V_{CEO}	800	V
Emitter-Base Voltage		V_{EBO}	5	V
Collector Current	DC	I_C	18	A
	Pulse	I_{CP}	35	
Base Current		I_B	4	A
Collector Power Dissipation ($T_c=25^\circ C$)		P_C	85	W
Junction Temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55 ~ 150	$^\circ C$



DMV1500M

CHARACTERISTIC	SYMBOL	RATING	UNIT
		B	
Transient Peak Reverse Voltage	V_{RSM}	1500	V
Peak Reverse Voltage	V_{RM}	1500	V
Average Forward Current	$I_{F(AV)}$	6	A
Peak Surge Forward Current	I_{FSM}	75	A
I_t Limiting Value	I_t	12.5	A^2s
Junction Temperature	T_j	-40 ~ +150	$^\circ C$
Storage Temperature	T_{stg}	-40 ~ +150	$^\circ C$
Forward Voltage Drop	V_F	1.65 cat $T_j=120^\circ C$	V
Revene Recovery Time		cat $I_F=1A$ $T_j=25^\circ C$	us



MTV021

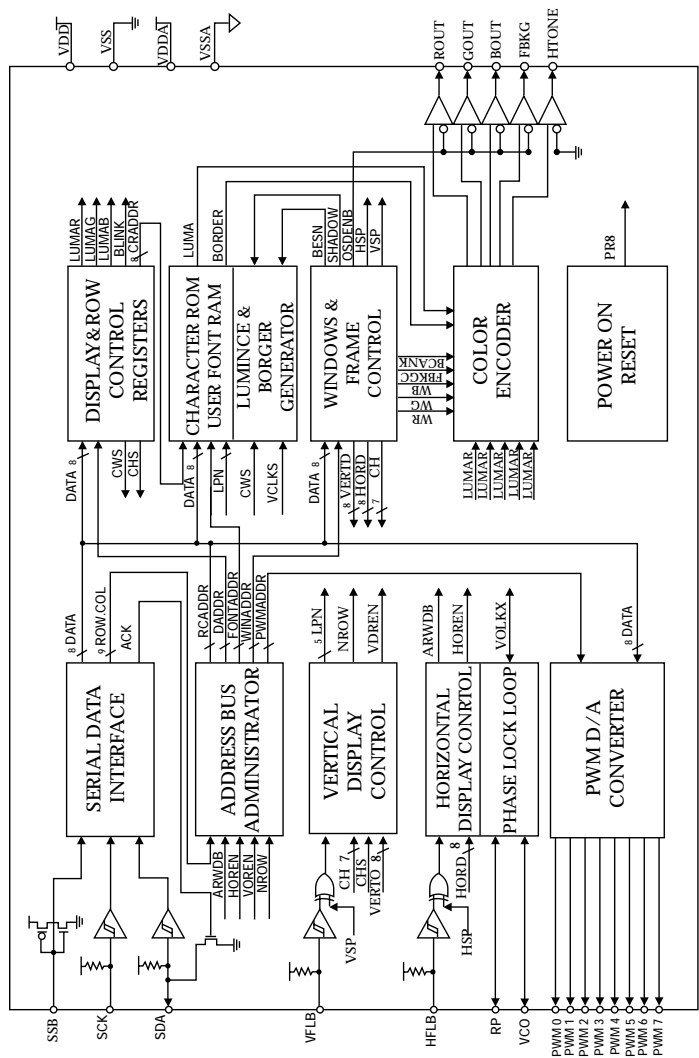
FEATURES

- Horizontal SYNC input up to 120 KHz.
- On-chip PLL circuitry up to 96MHz
- Programmable horizontal resolutions up to 1524 dots per display row
- Full-screen display consists of 15(rows) by 30(columns) characters.
- 12 x 18 dot matrices per character.
- Total of 272 characters and graphic fonts, including 256 standard and 16 multi-color mark ROM fonts.
- 8 color-selectable maximum per display character.
- 7 color-selectable maximum for character background.
- Double character height and/or width control.
- Programmable positioning for display screen center.
- Bordering, shadowing and blinking effect.
- Programmable character height(18 to 71 nl lines)control.
- Row to row spacing register to manipulate the constant display height.
- 4 programmable background windows with multi-level operation and shadowing on window effect.
- Software clears bit for full-screen erasing.
- Half tone and fast blanking output.
- Fade-in fade-out effect.
- 8-channel/8-bit PWM D/A converter output.
- Compatible with SPI bus or I²C interface with slave address 7AH(slave address is mask option)
- 16-pin,20-pin or 24-pin PDIP package.

GENERAL DESCRIPTION

- MTV021 is designed for monitor applications to display built-in characters or fonts onto monitor screen. The display operation occurs by transferring data and control information from the micro-controller to RAM through a serial data interface. It can execute full-screen display automatically, as well as specific functions such as character background color, bordering, shadowing, blinking, double height and width, font by font color control, frame positioning, frame size control by character height and row-to-row spacing, horizontal display resolution, full-screen erasing, fade-in.fade-out effect, windowing effect and shadowing on window.
- MTV021 provides 256 standard and 16 multi-color characters and graphic fonts for more efficacious applications. The full OSD menu is formed by 15 rows x30 columns, which can be positioned anywhere on the monitor screen by changing vertical or horizontal delay
- Moreover, MTV021 also provides 8 PWM DAC channels with 8-bit resolution and a PWM clock output for external digital-to-analog control.

BLOCK DIAGRAM



PIN CONNECTION

VSSA	1	16	VSS	VSSA	1	20	VSS	VSSA	1	24	VSS
VCO	2	15	ROUT	VCO	2	19	ROUT	VCO	2	23	ROUT
RP	3	14	GOUT	RP	3	18	GOUT	RP	3	22	GOUT
VDDA	4	13	BOUT	VDDA	4	17	BOUT	VDDA	4	21	BOUT
HFLB	5	12	FBKG	HFLB	5	16	FBKG	HFLB	5	20	FBKG
SSB	6	11	HTONE/PWMCK	SSB	6	15	HTONE/PWMCK	SSB	6	19	HTONE/PWMCK
SDA	7	10	VFLB	SDA	7	14	VFLB	SDA	7	18	VFLB
SCK	8	9	VDD	SCK	8	13	VDD	SCK	8	17	VDD
				PWM0	9	12	PWM 7	PWM0	9	16	PWM 7
				PWM1	10	11	PWM 6	PWM1	10	15	PWM 6
								PWM2	11	14	PWM 5
								PWM3	12	13	PWM 4

PIN DESCRIPTIONS

Name	I/O	PIN NO.			Descriptions
		N16	N20	N24	
VSSA	-	1	1	1	Analog ground. This ground pin is used to internal analog circuitry.
VCO	I/O	2	2	2	Voltage Control Oscillator. This pin is used to control the internal oscillator frequency by DC voltage input from external low pass filter.
RP	I/O	3	3	3	Bias Resistor. The bias resistor is used to regulate the appropriate bias current for internal oscillator to resonate at specific dot frequency.
VDDA	-	4	4	4	Analog power supply. Positive 5V DC supply for internal analog circuitry. Any a 0.1uF decoupling capacitor should be connected across to VDDA and VSSA.
HFLB	I	5	5	5	Horizontal input. This pin is used to input the horizontal synchronizing signal. It is a leading edge triggered and has an internal pull-up resistor.
SSB	I	6	6	6	Serial interface enable. It is used to enable the serial data and is also used to select the operation of I ² C or SPI bus. If this pin is left floating, I2C bus is enabled, otherwise the SPI bus is enabled.
SDA	I	7	7	7	Serial data input . The external data transfer through this pin to internal display registers and control registers. It has an internal pull-up resistor.
SCK	I	8	8	8	Serial clock input. The clock-input pin is used to synchronize the data transfer. It has an internal pull-up resistor.
PWM0	O	-	9	9	Open-Drain PWM D/A converter 0. The output pulse width is programmable by the register of Row 15, Column 23.
PWM1	O	-	10	10	Open-Drain PWM D/A converter 1. The output pulse width is programmable by the register of Row 15, Column 24.
PWM2	O	-	-	11	Open-Drain PWM D/A converter 2. The output pulse width is programmable by the register of Row 15, Column 25.
PWM3	O	-	-	12	Open-Drain PWM D/A converter 3. The output pulse width is programmable by the register of Row 15, Column 26.

Name	I/O	PIN NO.			Descriptions
		N16	N20	N24	
PWM4	O	-	-	13	Open-Drain PWM D/A converter 4. The output pulse width is programmable by the register of Row 15, Column 27.
PWM5	O	-	-	14	Open-Drain PWM D/A converter 5. The output pulse width is programmable by the register of Row 15, Column 28.
PWM6	O	-	11	15	Open-Drain PWM D/A converter 6. The output pulse width is programmable by the register of Row 15, Column 29.
PWM7	O	-	12	16	Open-Drain PWM D/A converter 7. The output pulse width is programmable by the register of Row 15, Column 30.
VDD	-	9	13	17	Digital power supply. Positive 5V DC supply for internal digital circuitry and a 0.1uF decoupling capacitor should be connected across to VDD and VSS.
VFLB	I	10	14	18	Vertical input. This pin is used to input the vertical synchronizing signal. it is leading triggered and has an internal pull-up resistor.
HTONE/ PWMCK	O	11	15	19	Half tone output /PWM clock output. This is a multiplexed pin selected by PWMCK bit. This pin can be a PWM clock or used to attenuate R.G.B gain of VGA for the transparent windowing effect.
FBKG	O	12	16	20	Fast Blanking output. It is used to cut off external R,G,B signals of VGA white this chip is displaying characters or windows.
BOUT	O	13	17	21	Blue color output. It is a blue color video signal output.
GOUT	O	14	18	22	Green Color output. It is a green color video signal output.
ROUT	O	15	19	23	Red Color output. It is a red color video signal output.
VSS	O	16	20	24	Digital ground. This ground pin is used to internal digital circuitry.

FUNCTIONAL DESCRIPTIONS

SERIAL DATA INTERFACE

The serial data interface receives data transmitted from an external controller. And there are 2 types of bus can be accessed through the serial data interface, one is SPI bus and other is I²C bus.

SPI bus

While SSB pin is pulled to “high” or “low” level, the SPI bus operation is selected. And a valid transmission should be starting from pulling SSB to “low” level, enabling MTV021 to receiving mode, and retain “low” level until the last cycle for a complete data packet transfer. The protocol is shown in Figure 1.

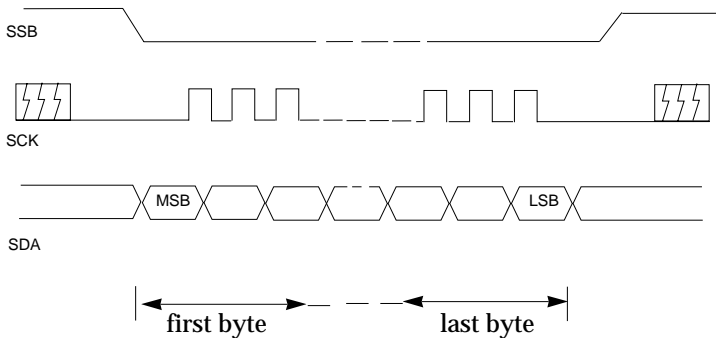
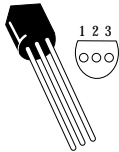


FIGURE 1. Data Transmission Protocol(SPI)

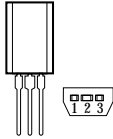
TRANSISTORS

Type No.	MAX. RATINGS			$V_{CE(SET)}$		Max				Package
	V_{CEO} (V)	I_C (mA)	P_C (mW)	(V)	I_C (mA)	I_B (mA)	1	2	3	
KSP45	350	300	1.5W	0.5	10	1	E	B	C	TO-92
KTA1273Y	-30	-2.0	1W	-2.0	-1.5	-30	E	C	B	TO-92L
KSA928Y	-30	-2.0A	1W	-2.0	-1.5A	-30	E	C	B	TO-92L
KSA1013	-160	-1.0A	0.9W	-1.5	-500	-50	E	C	B	TO-92L
KSD1616Y	50	1	0.75W	0.3	1A	50	E	C	B	TO-92
KSA733CY	-50	-150	250	-0.3	-100	-10	E	C	B	TO-92
IRF630A	200V	9A	72W	0.4 Ω (MAX) RDS(ON)		$\pm 30V$ (VGSS)	G	D	S	TO-220AB
KTC3198Y	50	150	625	0.25	100	10	E	C	B	TO-92
KSC945CY	50	150	250	0.15	100	10	E	C	B	TO-92
KTC3205Y	30	2A	1W	2.0	1.5A	30	E	B	C	TO-92L
KSP42	300	500	0.625	0.5	20	2	E	B	C	TO-92
KSP92	-300	-500	0.625	-0.5	-20	-2	B	B	C	TO-92
KRC102M	50	100	400	-0.3	-100	-0.88	E	C	B	TO-92M
2SK2545	600V (VDSS)	6A(I _D)	40W (P _T)	1.2 Ω (MAX) RDS(ON)		$\pm 30V$ (VGSS)	G	D	S	TO-220IS
YTA630	200V (VDSS)	10A(I _D)	75W (P _T)	0.8 Ω (MAX) RDS(ON)		$\pm 20V$ (VGSS)	G	D	S	TO-220AB

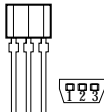
TO-92



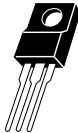
TO-92L



TO-92M



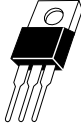
TO-220IS




TO-3P



TO-220AB



Replacement Parts List


PRODUCT SAFETY NOTICE : COMPONENTS MARKED WITH 
HAVE SPECIAL CHARACTERISTICS
IMPORTANT TO SAFETY.

ABBREVIATIONS :

RD R-CARBON	CK C-CERAMIC, HK
RS R-METAL OXIDE	CE C-ELECTROLYTIC
RX R-CEMENT	CC C-CERAMIC, TEMP
RN R-METAL($\pm 1\%$)	CQ C-POLYESTER, C-POLYPROPYLENE
	CF C-METAL POLYESTER C-METAL POLYPROPYLENE

NOTE : COMPONENTS OF THIS PARTS LIST CAN BE CHANGED FOR QUALITY
IMPROVEMENT WITHOUT INFORMATION.

MAIN BOARD

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
1		E420453191C	AC INLET ASSY,Q770	
2		3720101773	CONN-M,AC INLET SOLDER	
3		E4208519801	PCBA MA(I1*),Q770	
4		E4208819801	PCBA MA(I2*),Q770	
5		E4208919801	PCBA MA(I3*),Q770	
6		E4208419861	PCBA MA(A6*),Q770	
7		E4208419851	PCBA MA(A5*),Q770	
8		E4208419841	PCBA MA(A4*),Q770	
9		3040100886	PCB-SINGLE,Q770 MAIN F1 1	
10	BH01	3540200058	BD-FER,BFS3550	
11	BH02	3540200059	BD-FER,BFS3580	
12	BH03	3540200058	BD-FER,BFS3550	
13	BH04	3540200103	BD-FER,HF70 BTL 3.5*6B	
14	BH05	3540200058	BD-FER,BFS3550	
15	BH06	3540200058	BD-FER,BFS3550	
16	BH07	3540200059	BD-FER,BFS3580	
17	BH08	3540200058	BD-FER,BFS3550	
18	BP01	3540200059	BD-FER,BFS3580	
19	BP02	3540200058	BD-FER,BFS3550	
20	BV01	3540200058	BD-FER,BFS3550	
21	CH25	2131040020	CAP-MULT,0.1UF 50V Z AXI	
22	CH60	2131040020	CAP-MULT,0.1UF 50V Z AXI	
23	CM10	2133300004	CAP-MULT,33PF 50V J AXI	
24	CM12	2131040020	CAP-MULT,0.1UF 50V Z AXI	
25	C023	2131040020	CAP-MULT,0.1UF 50V Z AXI	
26	C027	2131040020	CAP-MULT,0.1UF 50V Z AXI	
27	DH01	DT1N4148	DIODE,1N4148 TAPING	
28	DH02	DT1N4936	DIODE,400V 1.0A 1N4936	
29	DH03	DT1N4936	DIODE,400V 1.0A 1N4936	
30	DH04	DT1N4936	DIODE,400V 1.0A 1N4936	
31	DH05	DTUZ-3.3BSB	DIODE,ZENER UZ-3.3BSB	
32	DH06	DT1N4148	DIODE,1N4148 TAPING	
33	DH07	3100500178	DI-SW,UF1G-5705 LEAD	
34	DH08	DT1N4148	DIODE,1N4148 TAPING	
35	DH09	DT1N4148	DIODE,1N4148 TAPING	
36	DH13	3100500178	DI-SW,UF1G-5705 LEAD	
37	DH14	DT1N4007	DIODE,1000V 1.0A TAP	
38	DH15	DT1N4007	DIODE,1000V 1.0A TAP	
39	DH16	DT1N4007	DIODE,1000V 1.0A TAP	
40	DH17	DT1N4007	DIODE,1000V 1.0A TAP	
41	DH18	DT1N4007	DIODE,1000V 1.0A TAP	
42	DH19	DT1N4937	DIODE,1N4937 TAPING	
43	DH20	DT1N4936	DIODE,400V 1.0A 1N4936	
44	DH21	DT1N4936	DIODE,400V 1.0A 1N4936	
45	DH22	DT1N4148	DIODE,1N4148 TAPING	
46	DH23	DT1N4148	DIODE,1N4148 TAPING	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
47	DH24	DT1N4007	DIODE,1000V 1.0A TAP	
48	DH25	DT1N4148	DIODE,1N4148 TAPING	
49	DH26	DT1N4007	DIODE,1000V 1.0A TAP	
50	DH27	DT1N4937	DIODE,1N4937 TAPING	
51	DH28	DTUF4007	DIODE,UF4007	
52	DH30	DT1N4148	DIODE,1N4148 TAPING	
53	DH31	DT1N4148	DIODE,1N4148 TAPING	
54	DH32	DT1N4936	DIODE,400V 1.0A 1N4936	
55	DM01	DT1N4148	DIODE,1N4148 TAPING	
56	DP01	DT1N5398	DIODE 1N5398 TAPING	
57	DP02	DT1N5398	DIODE 1N5398 TAPING	
58	DP03	DT1N5398	DIODE 1N5398 TAPING	
59	DP04	DT1N5398	DIODE 1N5398 TAPING	
60	DP05	DT1N4148	DIODE,1N4148 TAPING	
61	DP06	DT1N4937	DIODE,1N4937 TAPING	
62	DP07	DT1N4937	DIODE,1N4937 TAPING	
63	DP08	DT1N4148	DIODE,1N4148 TAPING	
64	DP09	DT1N4148	DIODE,1N4148 TAPING	
65	DP10	DT1N4148	DIODE,1N4148 TAPING	
66	DP12	DTUF4007	DIODE,UF4007	
67	DP14	DTUF4004	DIODE,UF4004	
68	DP16	DT1N4148	DIODE,1N4148 TAPING	
69	DV01	DTUF4002	DIODE,UF4002	
70	J001	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
71	J002	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
72	J003	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
73	J004	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
74	J005	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
75	J006	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
76	J007	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
77	J008	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
78	J009	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
79	J010	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
80	J011	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
81	J012	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
82	J013	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
83	J014	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
84	J015	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
85	J016	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
86	J017	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
87	J018	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
88	J020	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
89	J021	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
90	J022	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
91	J023	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
92	J024	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
93	J025	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
94	J026	375300002401	WIRE-NS-S43MM TAP. SDA 1/	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
95	J027	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
96	J028	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
97	J029	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
98	J030	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
99	J031	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
100	J032	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
101	J033	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
102	J034	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
103	J035	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
104	J036	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
105	J037	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
106	J038	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
107	J039	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
108	J040	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
109	J041	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
110	J042	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
111	J043	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
112	J044	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
113	J045	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
114	J046	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
115	J047	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
116	J048	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
117	J049	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
118	J050	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
119	J051	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
120	J052	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
121	J053	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
122	J054	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
123	J055	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
124	J056	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
125	J057	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
126	J058	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
127	J059	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
128	J060	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
129	J061	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
130	J062	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
131	J063	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
132	J064	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
133	J065	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
134	J066	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
135	J067	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
136	J068	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
137	J069	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
138	J070	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
139	J071	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
140	J072	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
141	J073	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
142	J074	375300002401	WIRE-NS-S43MM TAP. SDA 1/	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
143	J075	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
144	J076	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
145	J077	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
146	J078	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
147	J079	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
148	J081	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
149	J082	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
150	J083	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
151	LH04	E42019097250	COIL,PEAKING 22 UH AXIAL	
152	L007	E42019097250	COIL,PEAKING 22 UH AXIAL	
153	RH01	RD-8P0T0821J	RES-CF, RD 1/8W 820 OHM J	
154	RH02	RD-8P0T0331J	RES-CF, RD 1/8W 330 OHM J	
155	RH03	RD-8P0T0331J	RES-CF, RD 1/8W 330 OHM J	
156	RH04	RN-8P0T2201F	RES-MF, RN 1/8W 2.2KOHM F	
157	RH05	RN-8P0T1802F	RES-MF, RN 1/8W 18K OHM F	
158	RH06	RN-8P0T6491F	RES-MF, RN 1/8W 6.49KOHM F	
159	RH07	RD-8P0T0274J	RES-CF, RD 1/8W 270K OHM J	
160	RH08	RN-8P0T6801F	RES-MF, RN 1/8W 6.8KOHM F	
161	RH09	RN-8P0T1002F	RES-MF, RN 1/8W 10K OHM F	
162	RH10	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
163	RH100	RD-8P0T0471J	RES-CF, RD 1/8W 470 OHM J	
164	RH101	RD-4P0T0474J	RES-CF, RD 1/4W 470K OHM J	
165	RH11	RN-8P0T2052F	RES-MF, RN 1/8W 20.5KOHM F	
166	RH12	RN-8P0T2052F	RES-MF, RN 1/8W 20.5KOHM F	⚠
167	RH13	2441602003	RES-MF, 16K 0.125W F A	⚠
168	RH14	RD-8P0T0332J	RES-CF, RD 1/8W 3.3K OHM J	⚠
169	RH15	2442941001	RES-MF, 2.94K 0.125W F A	
170	RH16	2402709006	RES-CF, 27 0.5W J M	
171	RH17	2401001010	RES-CF, 1K 0.5W J M	
172	RH18	RD-8P0T0752J	RES-CF, RD 1/8W 7.5K OHM J	
173	RH19	RD-8P0T0363J	RES-CF, RD 1/8W 36K OHM J	
174	RH20	RD-8P0T0123J	RES-CF, RD 1/8W 12KOHM J	
175	RH21	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
176	RH22	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
177	RH23	2401001010	RES-CF, 1K 0.5W J M	
178	RH24	RD-8P0T0512J	RES-CF, RD 1/8W 5.1K OHM J	
179	RH26	RD-8P0T0362J	RES-CF, RD 1/8W 3.6K OHM J	
180	RH27	RD-8P0T0274J	RES-CF, RD 1/8W 270K OHM J	
181	RH28	RD-8P0T0362J	RES-CF, RD 1/8W 3.6K OHM J	
182	RH29	RD-4P0T0220J	RES-CF, RD 1/4W 22 OHM J	
183	RH30	2401801006	RES-CF, 1.8K 0.5W J M	
184	RH31	RD-8P0T0104J	RES-CF, RD 1/8W 100K OHM J	
185	RH32	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
186	RH33	RD-4P0T0362J	RES-CF, RD 1/4W 3.6K OHM J	
187	RH34	2441972001	RES-MF, 19.7K 0.125W F A	⚠
188	RH35	RD-4P0T0681J	RES-CF, RD 1/4W 680 OHM J	
189	RH36	RN-8P0T5101F	RES-MF, RN 1/8W 5.1KOHM F	⚠
190	RH37	2542208003	RES-FUS, 2.2 1W J M	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
191	RH38	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
192	RH39	RD-8P0T0820J	RES-CF, RD 1/8W 82 OHM J	
193	RH40	RD-4P0T0332J	RES-CF, RD 1/4W 3.3K OHM J	
194	RH41	RD-4P0T0220J	RES-CF, RD 1/4W 22 OHM J	
195	RH42	RD-8P0T0223J	RES-CF, RD 1/8W 22K OHM J	
196	RH45	2461801006	RES-MOF, 1.8K 2W J M	
197	RH46	RD-8P0T0150J	RES-CF, RD 1/8W 15 OHM J	
198	RH47	RD-8P0T0473J	RES-CF, RD 1/8W 47K OHM J	
199	RH48	2404700007	RES-CF, 470 0.5W J M	
200	RH50	RD-4P0T0334J	RES-CF, RD 1/4W 330K OHM J	
201	RH51	2463008001	RES-MOF, 3 2W J M	
202	RH52	2461000007	RES-MOF, 100 1W J M	
203	RH53	RD-8P0T0222J	RES-CF, RD 1/8W 2.2K OHM J	
204	RH54	2463009001	RES-MOF, 30 2W J M	
205	RH55	RD-4P0T0122J	RES-CF, RD 1/4W 1.2K OHM J	
206	RH56	2401500007	RES-CF, 150 0.5W J A	
207	RH57	2461501003	RES-MOF, 1.5K 2W J M	
208	RH58	RD-4P0T0223J	RES-CF, RD 1/4W 22K OHM J	
209	RH59	RD-4P0T0223J	RES-CF, RD 1/4W 22K OHM J	
210	RH60	RD-4P0T0223J	RES-CF, RD 1/4W 22K OHM J	
211	RH61	RD-8P0T0123J	RES-CF, RD 1/8W 12KOHM J	
212	RH62	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
213	RH63	RD-8P0T0123J	RES-CF, RD 1/8W 12KOHM J	
214	RH64	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
215	RH65	RD-8P0T0123J	RES-CF, RD 1/8W 12KOHM J	
216	RH66	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
217	RH67	2463008001	RES-MOF, 3 2W J M	
218	RH68	2463009001	RES-MOF, 30 2W J M	
219	RH69	RD-4P0T0274J	RES-CF, RD 1/4W 270K OHM J	
220	RH70	RD-8P0T0244J	RES-CF, RD 1/8W 240KOHM J	
221	RH71	RD-8P0T0183J	RES-CF, RD 1/8W 18K OHM J	
222	RH72	RD-8P0T0102J	RES-CF, RD 1/8W 1K OHM J	
223	RH73	RD-8P0T0332J	RES-CF, RD 1/8W 3.3K OHM J	
224	RH74	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
225	RH75	RD-8P0T0124J	RES-CF, RD 1/8W 120K OHM J	
226	RH76	RD-8P0T0222J	RES-CF, RD 1/8W 2.2K OHM J	
227	RH77	RD-8P0T0513J	RES-CF, RD 1/8W 51K OHM J	
228	RH78	RD-8P0T0153J	RES-CF, RD 1/8W 15K OHM J	
229	RH80	RD-8P0T0123J	RES-CF, RD 1/8W 12KOHM J	
230	RH82	2407503002	RES-CF, 750K 0.25W J A	
231	RH83	RD-4P0T0364J	RES-CF, RD 1/4W 360K OHM J	
232	RH84	RD-8P0T0182J	RES-CF, RD 1/8W 1.8K OHM J	
233	RH85	RD-8P0T0102J	RES-CF, RD 1/8W 1K OHM J	
234	RH86	240270800101	RES-CF, 2.7 0.5W J M	
235	RH87	RD-8P0T0473J	RES-CF, RD 1/8W 47K OHM J	
236	RH88	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
237	RH89	RD-8P0T0243J	RES-CF, RD 1/8W 24K OHM J	
238	RH90	RD-4P0T0101J	RES-CF, RD 1/4W 100 OHM J	


NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
239	RH91	RD-4P0T0753J	RES-CF, RD 1/4W 75KOHM J	
240	RH92	RD-4P0T0475J	RES-CF, RD 1/4W 4.7M OHM J	
241	RH93	RD-8P0T0152J	RES-CF, RD 1/8W 1.5K OHM J	
242	RH94	RD-8P0T0823J	RES-CF, RD 1/8W 82K OHM J	
243	RH96	RD-4P0T0475J	RES-CF, RD 1/4W 4.7M OHM J	
244	RH97	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
245	RH98	RD-8P0T0243J	RES-CF, RD 1/8W 24K OHM J	
246	RH99	2540228001	RES-FUS, 0.22 0.5W J A	
247	RM01	RD-8P0T0432J	RES-CF, RD 1/8W 4.3KOHM J	
248	RM02	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
249	RM04	RD-8P0T0105J	RES-CF, RD 1/8W 1M OHM J	
250	RM05	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
251	RM06	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
252	RM07	RD-8P0T0152J	RES-CF, RD 1/8W 1.5K OHM J	
253	RM08	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
254	RM09	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
255	RM11	RD-8P0T0153J	RES-CF, RD 1/8W 15K OHM J	
256	RM12	RD-8P0T0153J	RES-CF, RD 1/8W 15K OHM J	
257	RM13	RD-8P0T0473J	RES-CF, RD 1/8W 47K OHM J	
258	RM14	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
259	RM16	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
260	RM17	RD-8P0T0473J	RES-CF, RD 1/8W 47K OHM J	
261	RM18	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
262	RM19	RD-8P0T0102J	RES-CF, RD 1/8W 1K OHM J	
263	RM20	RD-8P0T0153J	RES-CF, RD 1/8W 15K OHM J	
264	RM21	RD-8P0T0153J	RES-CF, RD 1/8W 15K OHM J	
265	RM22	RD-8P0T0104J	RES-CF, RD 1/8W 100K OHM J	
266	RM29	RD-8P0T0432J	RES-CF, RD 1/8W 4.3KOHM J	
267	RM32	RD-4P0T0330J	RES-CF, RD 1/4W 33 OHM J	
268	RM33	RD-4P0T0302J	RES-CF, RD 1/4W 3K OHM J	
269	RM34	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
270	RM36	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
271	RM37	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
272	R011	2401000008	RES-CF, 100 0.5W J M	
273	R012	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
274	R013	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
275	R014	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
276	R015	RD-8P0T0101J	RES-CF, RD 1/8W 100 OHM J	
277	R016	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
278	R017	RD-8P0T0331J	RES-CF, RD 1/8W 330 OHM J	
279	R018	RD-8P0T0331J	RES-CF, RD 1/8W 330 OHM J	
280	R019	RD-8P0T0331J	RES-CF, RD 1/8W 330 OHM J	
281	R020	RD-8P0T0102J	RES-CF, RD 1/8W 1K OHM J	
282	R021	RD-8P0T0151J	RES-CF, RD 1/8W 150 OHM J	
283	R022	RD-8P0T0105J	RES-CF, RD 1/8W 1M OHM J	
284	R023	RD-8P0T0562J	RES-CF, RD 1/8W 5.6K OHM J	
285	R024	RD-8P0T0622J	RES-CF, RD 1/8W 6.2K OHM J	
286	R025	RD-8P0T0562J	RES-CF, RD 1/8W 5.6K OHM J	




NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
287	R045	RD-8P0T0202J	RES-CF, RD 1/8W 2K OHM J	
288	R046	RD-8P0T0202J	RES-CF, RD 1/8W 2K OHM J	
289	RP01	2401004008	RES-CF, 1M 0.5W J M	
290	RP02	RD-4P0T0271J	RES-CF, RD 1/4W 270 OHM J	
291	RP03	RD-4P0T0471J	RES-CF, RD 1/4W 470 OHM J	
292	RP04	2465602005	RES-MOF, 56K 2W J M	
293	RP05	2401004008	RES-CF, 1M 0.5W J M	
294	RP07	2442402005	RES-MF, 24K 0.125W F A	
295	RP08	RD-4P0T0220J	RES-CF, RD 1/4W 22 OHM J	
296	RP09	2541001002	RES-FUS, 1K 0.25W J A	
297	RP10	RD-4P0T0102J	RES-CF, RD 1/4W 1K OHM J	
298	RP12	RD-8P0T0204J	RES-CF, RD 1/8W 200K OHM J	
299	RP13	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
300	RP14	RD-8P0T0154J	RES-CF, RD 1/8W 150K OHM J	
301	RP15	RD-4P0T0331J	RES-CF, RD 1/4W 330 OHM J	
302	RP16	2442322002	RES-MF, 23.2K 0.125W F A	
303	RP17	RD-4P0T04R7J	RES-CF, RD 1/4W 4.7 OHM J	
304	RP18	2401004008	RES-CF, 1M 0.5W J M	
305	RP19	RD-4P0T0623J	RES-CF, RD 1/4W 62K OHM J	
306	RP20	RD-8P0T0223J	RES-CF, RD 1/8W 22K OHM J	
307	RP21	RD-4P0T0154J	RES-CF, RD 1/4W 150K OHM J	
308	RP22	2465102001	RES-MOF, 51K 1W J M	
309	RP23	RD-8P0T0154J	RES-CF, RD 1/8W 150K OHM J	
310	RP24	RD-4P0T0102J	RES-CF, RD 1/4W 1K OHM J	
311	RP25	RD-4P0T0681J	RES-CF, RD 1/4W 680 OHM J	
312	RP27	2406800008	RES-CF, 680 0.5W J M	
313	RP28	2461001005	RES-MOF, 1K 1W J M	
314	RP29	2463309006	RES-MOF, 33 1W J M	
315	RP30	RD-8P0T0271J	RES-CF, RD 1/8W 270 OHM J	
316	RP31	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
317	RP32	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
318	RV01	2545108002	RES-FUS, 5.1 1W J M	
319	RV02	RN-8P0T5601F	RES-MF, RN 1/8W 5.6KOHM F	
320	RV04	2401008007	RES-CF, 1 0.5W J M	
321	RV05	RD-4P0T01R5J	RES-CF, RD 1/4W 1.5 OHM	
322	RV07	2542708001	RES-FUS, 2.7 1W J A	
323	RV08	RD-4P0T0332J	RES-CF, RD 1/4W 3.3K OHM J	
324	RV09	2401001010	RES-CF, 1K 0.5W J M	
325	RV10	RD-8P0T0562J	RES-CF, RD 1/8W 5.6K OHM J	
326	RV11	RD-8P0T0562J	RES-CF, RD 1/8W 5.6K OHM J	
327	RV18	RN-4P0T3402F	RES-MF, RN 1/4W 34KOHM F	
328	RV19	RN-4P0T5601F	RES-MF, RN 1/4W 5.6KOHM F	
329	ZDH01	DTUZ-12BSB	DIODE, ZENER UZ-12BSB TAP	
330	ZDH02	DTUZ-13B	DIODE, ZENER UZ-13B	
331	ZDH03	DTUZ-13B	DIODE, ZENER UZ-13B	
332	ZDM01	DTUZ-6.2BSB	DIODE, ZENER UZ-6.2BSB T	
333	ZDM02	DTUZ-6.2BSB	DIODE, ZENER UZ-6.2BSB T	
334	ZDM03	DTUZ-5.1BSB	DIODE, ZENER UZ-5.1BSB TAP	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
335	ZDM04	DTUZ-5.1BSB	DIODE,ZENER UZ-5.1BSB TAP	
336	ZDM05	DTUZ-5.1BSB	DIODE,ZENER UZ-5.1BSB TAP	
337	ZD001	DTUZ-5.6BSB	DIODE,ZENER UZ-5.6BSB TAP	
338	CH01	CF93BT1J474J	CAP-MPE,63V 0.47UF J	
339	CH02	CQ92BT2A154J	CAP-PE,100V 0.15UF J	
340	CH03	CQ92BT2A822J	CAP-PE,100V 0.0082UF J	
341	CH04	CQ92BT2A104J	CAP-PE,100V 0.1UF J	
342	CH05	CQ92BT2A103J	CAP-PE,100V 0.01UF J	
343	CH06	E42007019220	CAP-PP/PE,100V 680PF J	
344	CH07	CE04BT1H010M	CAP-EL,SMS 50V 1UF M	
345	CH08	CQ92BT2A152J	CAP-PE,100V 1500PF J	
346	CH09	CQ92BT2A102J	CAP-PE,100V 0.001UF J	
347	CH10	CE04BT1HR47M	CAP-EL,SMS 50V 0.47UF M	
348	CH11	CQ92BT2A332J	CAP-PE,100V 3300PF J	
349	CH12	CE04BT1H4R7M	CAP-EL,SMS 50V 4.7UF M	
350	CH13	CQ92BT2A333J	CAP-PE,100V 0.033UF J	
351	CH15	CQ92BT2A332J	CAP-PE,100V 3300PF J	
352	CH16	CF93BT1J105J	CAP-MPE,63V 1UF J	
353	CH17	CK45BT3A331K	CAP-CE,1KV 330PF K TAP	
354	CH18	214474001702	CAP-M-P,0.47UF 250V J 7.5	
355	CH19	CE04BT1H100M	CAP-EL,SMS 50V 10UF M	
356	CH20	CQ92BT2A182J	CAP-PE,100V 1800PF J	
357	CH21	CF93BT1J334J	CAP-MPE,63V 0.33UF J	
358	CH22	CE04BT1C470M	CAP-EL,SMS 16V 47UF M	
359	CH23	217472001501	CAP-P-F,4700PF 1600V J 7.	⚠
360	CH24	CE04IT1V470M	CAP-EL,KME 35V 47UF M	
361	CH26	CK45BT3A221K	CAP-CD,1KV 220PF K TAP	
362	CH28	CE04IT1H010M	CAP-EL,KME 50V 1UF M	
363	CH30	CE04IT1H010M	CAP-EL,KME 50V 1UF M	
364	CH31	2174720021	CAP-P-F,4700PF 800V J RAD	⚠
365	CH32	2142240021	CAP-M-P,0.22UF 250V J RAD	
366	CH33	CE04BT1H010M	CAP-EL,SMS 50V 1UF M	
367	CH34	2148230001	0.082 UF 250 V J RAD	
368	CH35	CQ92BT2A473J	CAP-PE,100V 0.047UF J	
369	CH38	CK45BT3A102K	CAP-CD,1KV 1000PF 10%	
370	CH39	CE04BT1C470M	CAP-EL,SMS 16V 47UF M	
371	CH40	CE04BT1C100M	CAP-EL,SMS 16V 10UF M TAP	
372	CH41	2101510007	CAP-CER,150PF 1KV K Y5P	
373	CH43	CQ92BT2A473J	CAP-PE,100V 0.047UF J	
374	CH44	CQ92BT2A223J	CAP-PE,100V 0.022UF J	
375	CH46	CE04BT1E101M	CAP-EL,SMS 25V 100UF M	
376	CH47	2002280012	CAP-AL,0.22UF 160V M 5*11	
377	CH48	CE04BT2C010M	CAP-EL,SMS 160V 1UF M	
378	CH49	CQ92BT2A102J	CAP-PE,100V 0.001UF J	
379	CH50	CE04BT1E101M	CAP-EL,SMS 25V 100UF M	
380	CH51	CQ92BT2A104J	CAP-PE,100V 0.1UF J	
381	CH52	CQ92BT2A102J	CAP-PE,100V 0.001UF J	
382	CH54	CE04BT2C220M	CAP-EL,SMS 160V 22UF M	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
383	CH57	2002210071	CAP-AL,220UF 16V M 8*9 P	
384	CH58	2172230011	CAP-P-F,0.022UF 250V J RA	
385	CH59	CE04BT1C470M	CAP-EL,SMS 16V 47UF M	
386	CH61	CF93BT1J224J	CAP-MPE,63V 0.22UF J	
387	CM01	CE04BT1H010M	CAP-EL,SMS 50V 1UF M	
388	CM02	CE04BT1HR33M	CAP-EL,SMS 50V 0.33UF M	
389	CM05	CC45CT1H220J	CAP-CD,50V 22PF J	
390	CM06	CC45CT1H220J	CAP-CD,50V 22PF J	
391	CM08	CE04BT1H0R1M	CAP-EL,SMS 50V 0.1UF M	
392	CM09	CQ92BT2A103J	CAP-PE,100V 0.01UF J	
393	CM11	E42007019220	CAP-PP/PE,100V 680PF J	
394	CM13	CE04BT1E470M	CAP-EL,SMS 25V 47UF M	
395	CM14	CE04BT1H010M	CAP-EL,SMS 50V 1UF M	
396	CM15	CE04BT1H010M	CAP-EL,SMS 50V 1UF M	
397	C022	CQ92BT2A104J	CAP-PE,100V 0.1UF J	
398	C024	CE04BT1C101M	CAP-EL,SMS 16V 100UF M	
399	C025	CQ92BT2A103J	CAP-PE,100V 0.01UF J	
400	C026	CE04BT1C101M	CAP-EL,SMS 16V 100UF M	
401	C028	CQ92BT2A103J	CAP-PE,100V 0.01UF J	
402	C029	CQ92BT2A222J	CAP-PE,100V 0.0022UF J	
403	CP02	E42007027050	CAP-CD,Y2 2200PF M TAP	
404	CP03	E42007027050	CAP-CD,Y2 2200PF M TAP	
405	CP08	2001010091	CAP-AL,100UF 25V M 6.3*11	
406	CP10	CQ92BT2A272J	CAP-PE,100V 0.0027UF J	
407	CP11	CK45BT3A101K	CAP-CD,1KV 100PF 10%	
408	CP13	CC45CT1H471J	CAP-CD,50V 470PF J	
409	CP14	CC45CT1H471J	CAP-CD,50V 470PF J	
410	CP15	CQ92BT2A332J	CAP-PE,100V 3300PF J	
411	CP16	CF93BT1J334J	CAP-MPE,63V 0.33UF J	
412	CP17	CQ92BT2A103J	CAP-PE,100V 0.01UF J	
413	CP18	CQ92BT2A332J	CAP-PE,100V 3300PF J	
414	CP19	2002290042	CAP-AL,2.2UF 50V M 5*11 N	
415	CP21	2002210076	CAP-AL,220UF 100V M 13*25	
416	CP23	2002200073	CAP-AL,22UF 160V M 10*20	
417	CP24	2004710059	CAP-AL,470UF 16V M 8*12 P	
418	CP25	2004710059	CAP-AL,470UF 16V M 8*12 P	
419	CP27	CE04BT1E681M	CAP-EL,SMS 25V 680UF M	
420	CP28	CE04BT1C470M	CAP-EL,SMS 16V 47UF M	
421	CP29	CE04BT1C470M	CAP-EL,SMS 16V 47UF M	
422	CP31	CE04BT1E471M	CAP-EL,SMS 25V 470UF M	
423	CP32	2101020018	CAP-CD,1000PF Y2 K TAP	
424	CP33	2101020018	CAP-CD,1000PF Y2 K TAP	
425	CV01	217562001401	CAP-P-F,5600PF 100V J 5.0	
426	CV03	2004710059	CAP-AL,470UF 16V M 8*12 P	
427	CV04	2004710059	CAP-AL,470UF 16V M 8*12 P	
428	CV05	2001010093	CAP-AL,100UF 35V M 8*11.5	
429	CV06	2141040020	CAP-M-P,0.1UF 250V J RAD	
430	CV07	CQ92BT2A104J	CAP-PE,100V 0.1UF J	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
431	CV08	2002200067	CAP-AL,22UF 16V M 5*11 P	
432	CV09	CQ92BT2A224J	CAP-PE,100V 0.22UF J	
433	CV10	CQ92BT2A102J	CAP-PE,100V 0.001UF J	
434	FP01	E42076013010	FUSE CLIP,TAPING	
435	LH02	3500100523	INDUCT-FIX,DR0808 8.2MH M	
436	QH01	TTKSC945CY	TR,KSC945C-Y	
437	QH02	3110100687	TR-GEN,KSA928AY LEAD	
438	QH05	TTKSC945CY	TR,KSC945C-Y	
439	QH06	TTKSA733CY	TR,KSA733C-Y	
440	QH08	TT2N7000	TR,2N7000	
441	QH10	3110100730	TR-GEN,KSD1616-YTA LEAD	
442	QH14	TTKSC945CY	TR,KSC945C-Y	
443	QH15	TTKSC945CY	TR,KSC945C-Y	
444	QH16	TTKSC945CY	TR,KSC945C-Y	
445	QH17	TTKSP45	TR,KSP45	
446	QH18	3110100689	TR-GEN,KSA1013Y LEAD	
447	QH19	TTKSC945CY	TR,KSC945C-Y	
448	QH21	TTKSA733CY	TR,KSA733C-Y	
449	QH22	TTKSC945CY	TR,KSC945C-Y	
450	QM01	TTKTC200Y	TR,KTC200Y TAP	
451	QM02	TTKTA200Y	TR,KTA200Y TAP	
452	QM03	TTKTC1815Y	TR,KTC3198Y	
453	QM04	TTKSC945CY	TR,KSC945C-Y	
454	QM05	TTKSA733CY	TR,KSA733C-Y	
455	QM06	TTKRC102M	TR,SWITCHING KRC102M	
456	QP01	TTKSP45	TR,KSP45	
457	QP02	TTKSC945CY	TR,KSC945C-Y	
458	QP03	3110100705	TR-GEN,KRC105M LEAD	
459	QP05	3110100687	TR-GEN,KSA928AY LEAD	
460	QP07	3110100687	TR-GEN,KSA928AY LEAD	
461	QP08	TTKRC102M	TR,SWITCHING KRC102M	
462	QP09	TTKTA1015Y	TR,KTA1266Y	
463	QV01	TTKSC945CY	TR,KSC945C-Y	
464	RH43	246100800701	RES-MOF,1 2W J M R-FORMIN	
465	RH44	246100800701	RES-MOF,1 2W J M R-FORMIN	
466	RH49	246430900301	RES-MOF,43 2W J R-FORMING	
467	RH79	246430900301	RES-MOF,43 2W J R-FORMING	
468	RH95	246120100601	RES-MOF,1.2K 2W J R-FORM	
469	RP06	246220300501	RES-MOF,220K 2W J R-FORMI	
470	RP11	246022800401	RES-MOF,0.22 2W R-FORM	
471	RP26	246220900601	RES-MOF,22 2W J R-FORMING	
472	XM01	3530200581	VIB-QUARTZ,12MHZ 22PF ATS	
473	AI01A	6130014100	EYELET,2.7PAI BRASS T=0.4	
474	AI01B	6130014100	EYELET,2.7PAI BRASS T=0.4	
475	CNM01	372010105301	CONN-M,POST 1P DEGT235 14	
476	CP05A	6130014100	EYELET,2.7PAI BRASS T=0.4	
477	CP05B	6130014100	EYELET,2.7PAI BRASS T=0.4	
478	G2	372010105301	CONN-M,POST 1P DEGT235 14	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
479	ICH02	3200001531	IC-LIN,LM358N DIP	
480	ICM02	3203000819	IC-MEM0,S524C80D81-DCB0	
481	ICP01	3200001536	IC-LIN,UC3843B DIP	
482	LP01A	6130014200	EYELET,1.6PAI BRASS T=0.4	
483	LP01B	6130014200	EYELET,1.6PAI BRASS T=0.4	
484	LP01C	6130014200	EYELET,1.6PAI BRASS T=0.4	
485	LP01D	6130014200	EYELET,1.6PAI BRASS T=0.4	
486	NTC01A	6130014200	EYELET,1.6PAI BRASS T=0.4	
487	NTC01B	6130014200	EYELET,1.6PAI BRASS T=0.4	
488	QH09A	6130014200	EYELET,1.6PAI BRASS T=0.4	
489	QH09B	6130014200	EYELET,1.6PAI BRASS T=0.4	
490	QH09C	6130014200	EYELET,1.6PAI BRASS T=0.4	
491	TH02A	6130014200	EYELET,1.6PAI BRASS T=0.4	
492	TH02B	6130014200	EYELET,1.6PAI BRASS T=0.4	
493	TH04A	6130014100	EYELET,2.7PAI BRASS T=0.4	
494	TH04B	6130014100	EYELET,2.7PAI BRASS T=0.4	
495	TH04C	6130014100	EYELET,2.7PAI BRASS T=0.4	
496	WHV01	372010105301	CONN-M,POST 1P DEGT235 14	
497	DH12	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
498	DH12	M31100030012	NUT HEX,6N1-3 MSZPC	
499	DH12	3102000245	DI-REC,DMV1500M LEAD	
500	ICV01	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
501	ICV01	UTDA9302H	IC,TDA9302H VER AMP	
502	ICV01	6124036600	H-SINKINK V,L=40 H=18.0 V	
503	QH03	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
504	QH03	M31100030012	NUT HEX,6N1-3 MSZPC	
505	QH03	3110100665	TR-GEN,KTD2061-Y LEAD	
506	QH07	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
507	QH07	3114000140	FET,YTA630 LEAD S770	
508	QH07	6124020510	H-SINKINK POWER,L=35 H=17	
509	QH09	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
510	QH09	M31100030012	NUT HEX,6N1-3 MSZPC	
511	QH09	3110100753	TR-GEN,TT2062 LEAD	
512	QH09	6120051000	SHLD-CASE,F/SHLD FBT ASY,	
513		6120043000	SOLDER GRIP,V770	
514		6120050000	SHLD-PL,FENCE SHIELD FBT	
515	QH11	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
516	QH11	3114000124	FET,IRF630A/IRF630M	
517	QH11	6124020508	H-SINK POWER,B790 L=22MM	
518	QP04	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
519	QP04	3114000106	FET,2SK2545-LB104 LEAD	
520	QP04	6124036602	H-SINK V,L=40,H=18 Q770	
521	CH27	2172240013	CAP-P-F,0.22UF 250V J RAD	
522	CH29	214494000101	CAP-M-P,0.49UF 250V J 20.	
523	CNM04	3720101389	CONN-M,SMW200-07P	
524	CNM05	3720101387	CONN-M,SMW200-05P	
525	CNM06	3720101978	CONN-M,SMW200-15 15	
526	CP01	E4200700909B	CAP-X,250VAC 0.22UF M 15.	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
527	CP04	2141540010	CAP-M-P, 0.15UF 250V M PP	
528	CP05	2001810001	CAP-AL, 180UF 400V M 25.4*	
529	FP01	E42025012060	FUSE, TIME LAG 19181 3.15A	
530	ICH01	3200001530	IC-LIN, TDA9116 32P SDIP D	
531	ICP02	3200001186	IC-LIN, L7805CV T02	
532	LP01	352020008601	FLT-LC, SEQ2828 25MH MIN	
533	PTC01	341130000901	POSISTOR, 90HM 2P CASE STI	
534	QH12	3114000080	FET, 2SK2134-S12 LEAD	
535	QH13	3114000124	FET, IRF630A/IRF630M	
536	RLP01	3710100085	RELAY, DY3M-DC12V 5A 250V	
537	SWH01	E42027014010	LEVER SWITCH, 30'C 3P	
538	TH01	3510300160	TRAN-SW, HDT E11916 G910	
539	TH03	3510300186	TRAN-SW, FOCUS EE2017 V771	
540	TP01	3510200132	TRAN-PW, EER3541 V771 W0/A	
541	TP02	E4203109004A	TRANS SYNC, UU1116 TUBE	
542		6120048600	SHLD-PL, G910/P911 MCU COV	
543	AI01	3720101302	CONN-M, YW396-03V(2ND P DE	
544	AR01	2502001003	RES NET, 2K 1/8W J SIP 6P	
545	CH45	210472001801	CAP-CER, 1KV 472K FOR	
546	CH53	2102230017	CAP-CER, 0.022UF 1KV J Z4U	
547	CNM02	3720101396	CONN-M, SMW250-02 2	
548	CNM03	3720101227	CONN-M, 5045-3A 3	
549	CP07	CK45BF2H103K	CAP-CD, 500V 0.01UF K	
550	CP09	210472001501	CAP-CER, Y1 4700PF M NO-CU	
551	DH10	3104100142	DI-SCHOT, 1N5822 LEAD	
552	DH11	3100500094	DI-SW, ERD07-15L LEAD	
553	DP11	3100500181	DI-SW, GUR460L-5703 LEAD	
554	DP13	3100500163	DI-SW, RG4 LF-L1(015-206)	
555	DP15	3100500163	DI-SW, RG4 LF-L1(015-206)	
556	ICM01	3205001382	IC-U, WT62P1-K42 DIP MTP	
557	ICM01	3721100830	CONN-F, WSDIF-42T-1.778MM	
558	IC002	3204000577	IC-INT, MTV021 9LANGUAGE D	
559	LH01	3500101612	INDUCT-FIX, AR5*30 V770 K	
560	LH03	3500100511	INDUCT-FIX, SIZE DR1523 5P	
561	NTC01	E4207708409A	THERMISTOR 180HM 13PAI TA	
562	TH02	3500101856	INDUCT-FIX, Q770 LIN COIL	
563	TH04	3510500090	FBT, Q770	

CRT BOARD

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
1		E4208619802	PCBA CRT(T1*),Q770	
2		E4208519802	PCBA CRT(I1*),Q770	
3		E4208919802	PCBA CRT(I3*),Q770	
4		E4208419862	PCBA CRT(A6*),Q770	
5		E4208419852	PCBA CRT(A5*),Q770	
6		E4208419842	PCBA CRT(A4*),Q770	
7	BC01	3540200058	BD-FER,BFS3550	
8	BC02	3540200059	BD-FER,BFS3580	
9	CC01	2131040020	CAP-MULT,0.1UF 50V Z AXI	
10	CC02	2131040020	CAP-MULT,0.1UF 50V Z AXI	
11	CC03	2131040020	CAP-MULT,0.1UF 50V Z AXI	
12	CC05	2131040020	CAP-MULT,0.1UF 50V Z AXI	
13	CC07	2131040020	CAP-MULT,0.1UF 50V Z AXI	
14	CC08	2131040020	CAP-MULT,0.1UF 50V Z AXI	
15	CC10	2131040020	CAP-MULT,0.1UF 50V Z AXI	
16	DC01	DT1N4148	DIODE,1N4148 TAPING	
17	DC02	DT1N4148	DIODE,1N4148 TAPING	
18	DC03	DT1N4148	DIODE,1N4148 TAPING	
19	DC04	DT1N4148	DIODE,1N4148 TAPING	
20	DC05	DT1N4148	DIODE,1N4148 TAPING	
21	DC06	DT1N4148	DIODE,1N4148 TAPING	
22	DC07	DTISS81	DIODE,SWITCHING ISS81	
23	DC08	DTISS81	DIODE,SWITCHING ISS81	
24	DC09	DTISS81	DIODE,SWITCHING ISS81	
25	DC10	DTISS81	DIODE,SWITCHING ISS81	
26	DC11	DTISS81	DIODE,SWITCHING ISS81	
27	DC12	DTISS81	DIODE,SWITCHING ISS81	
28	DC13	DTISS81	DIODE,SWITCHING ISS81	
29	DC14	DTISS81	DIODE,SWITCHING ISS81	
30	DC15	DTISS81	DIODE,SWITCHING ISS81	
31	JC01	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
32	JC02	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
33	JC03	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
34	JC04 0001	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
35	JC07	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
36	JC08	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
37	JC10	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
38	JC11	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
39	JC12	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
40	JC13	375300002401	WIRE-NS-S43MM TAP. SDA 1/	
41	LC01	3500101860	INDUCT-FIX,AL04TBR47K K A	
42	LC02	3500101860	INDUCT-FIX,AL04TBR47K K A	
43	LC03	3500101860	INDUCT-FIX,AL04TBR47K K A	
44	LC04	3500101860	INDUCT-FIX,AL04TBR47K K A	
45	LC05	3500101860	INDUCT-FIX,AL04TBR47K K A	
46	LC06	3500101860	INDUCT-FIX,AL04TBR47K K A	


NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
47	RC01	RD-8P0T0750J	RES-CF, RD 1/8W 75 OHM J	
48	RC02	RD-8P0T0330J	RES-CF, RD 1/8W 33 OHM J	
49	RC03	RD-8P0T0750J	RES-CF, RD 1/8W 75 OHM J	
50	RC04	RD-8P0T0330J	RES-CF, RD 1/8W 33 OHM J	
51	RC05	RD-8P0T0750J	RES-CF, RD 1/8W 75 OHM J	
52	RC06	RD-8P0T0330J	RES-CF, RD 1/8W 33 OHM J	
53	RC07	2466808004	RES-MOF, 6.8 1W J M	
54	RC08	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
55	RC09	RD-8P0T0331J	RES-CF, RD 1/8W 330 OHM J	
56	RC10	RD-8P0T0331J	RES-CF, RD 1/8W 330 OHM J	
57	RC11	RD-8P0T0102J	RES-CF, RD 1/8W 1K OHM J	
58	RC12	RD-8P0T0223J	RES-CF, RD 1/8W 22K OHM J	
59	RC13	RD-8P0T0472J	RES-CF, RD 1/8W 4.7K OHM J	
60	RC14	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
61	RC26	RD-4P0T0820J	RES-CF, RD 1/4W 82 OHM J	
62	RC27	RD-4P0T0820J	RES-CF, RD 1/4W 82 OHM J	
63	RC28	RD-4P0T0820J	RES-CF, RD 1/4W 82 OHM J	
64	RC29	2403309005	RES-CF, 33 0.5W J M	
65	RC30	2403309005	RES-CF, 33 0.5W J M	
66	RC31	2403309005	RES-CF, 33 0.5W J M	
67	RC33	RD-8P0T0824J	RES-CF, RD 1/8W 820K OHM J	
68	RC34	RD-8P0T0824J	RES-CF, RD 1/8W 820K OHM J	
69	RC35	RD-8P0T0824J	RES-CF, RD 1/8W 820K OHM J	
70	RC37	2401000008	RES-CF, 100 0.5W J M	
71	RC38	RD-4P0T0102J	RES-CF, RD 1/4W 1K OHM J	
72	RC39	RD-4P0T0102J	RES-CF, RD 1/4W 1K OHM J	
73	RC40	RD-4P0T0102J	RES-CF, RD 1/4W 1K OHM J	
74	CC04	CE04BT1C221M	CAP-EL, SMS 16V 220UF M	
75	CC06	CC45CT1H220J	CAP-CD, 50V 22PF J	
76	CC09	CE04BT1C101M	CAP-EL, SMS 16V 100UF M	
77	CC11	CQ92BT2A104J	CAP-PE, 100V 0.1UF J	
78	CC12	CE04BT2A470M	CAP-EL, SMS 100V 47UF M	
79	CC13	2001090053	CAP-AL, 1UF 100V M 5*11 NP	
80	CC14	2001090053	CAP-AL, 1UF 100V M 5*11 NP	
81	CC15	2001090053	CAP-AL, 1UF 100V M 5*11 NP	
82	CC16	CE04BT1C470M	CAP-EL, SMS 16V 47UF M	
83	CC17	CK45BN2H102K	CAP-CD, 500V 1000PF K	
84	CC19	2002280012	CAP-AL, 0.22UF 160V M 5*11	
85	CC20	2002280012	CAP-AL, 0.22UF 160V M 5*11	
86	CC21	2002280012	CAP-AL, 0.22UF 160V M 5*11	
87	CC22	CE04BT2C100M	CAP-EL, SMS 160V 10UF M	
88	CC23	CE04BT1HR22M	CAP-EL, SMS 50V 0.22UF M	
89	CC24	2141040020	CAP-M-P, 0.1UF 250V J RAD	
90	RC32	246100800601	RES-MOF, 1 1W J R-FORMING	
91	RC36	246220500101	RES-MOF, 22M 1W R-FORMING	
92	SGC01	3411100083	VARISTOR, SURGE ABSORBER R	
93	SGC02	3411100083	VARISTOR, SURGE ABSORBER R	
94	SGC03	3411100083	VARISTOR, SURGE ABSORBER R	

NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
95	SGC04	3411100084	VARISTOR,SURGE ABSORBER R	
96	SGC05	3411100043	VARISTOR,S23 1500V 1500V	
97	CGND	372010105301	CONN-M,POST 1P DEGT235 14	
98	ICC03	M11143008012	SCREW,BIN(+) M3*8 MSZPC	
99	ICC03	3200001527	IC-LIN,LM2467 T02	
100	ICC03	6124036603	H-SINK V,Q770	
101	CC18	2102230017	CAP-CER,0.022UF 1KV J Z4U	
102	CNC01	3720101978	CONN-M,SMW200-15 15	
103	CNC02	3720101388	CONN-M,SMW200-06P	
104	G2	375500076908	WIRE-ASS'Y,G2 180MM Q770	
105	ICC01	3200001526	IC-LIN,LM1267 DIP	
106	ICC04	3200001528	IC-LIN,LM2479 DIP	
107	SK01	3721101187	CONN-F,CRT SKT ISDW01S P9	

KEY BOARD

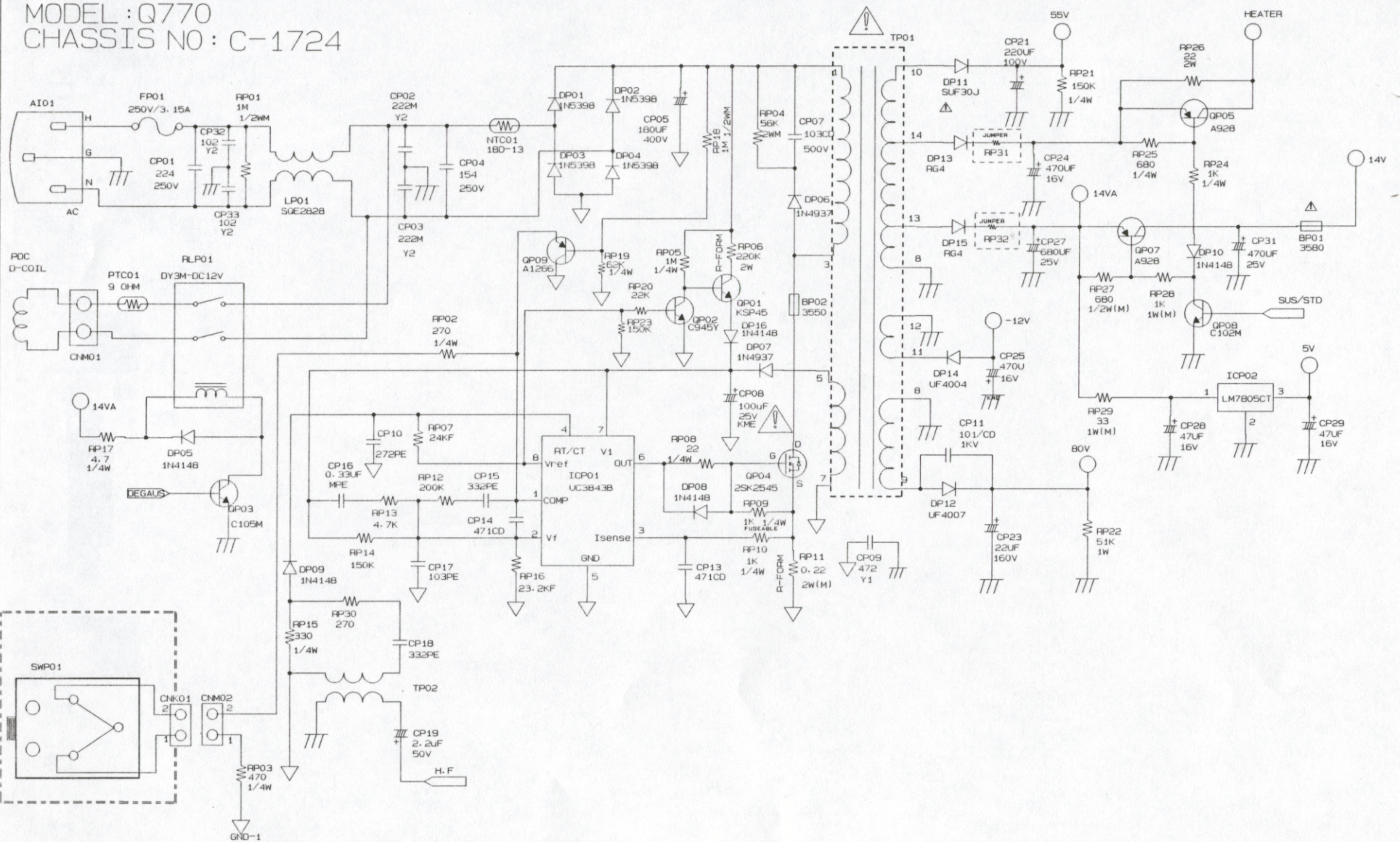
NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
1		E4208519803	PCBA KEY(I1*),Q770	
2		E4208819803	PCBA KEY(I2*),Q770	
3		E4208419853	PCBA KEY(A5*),Q770	
4		E4208419843	PCBA KEY(A4*),Q770	
5	RK01	RN-4P0T1742F	RES-MF,RN 1/4W 17.4KOHM F	
6	RK02	RD-8P0T0752J	RES-CF, RD 1/8W 7.5K OHM J	
7	RK03	RD-4P0T0103J	RES-CF, RD 1/4W 10K OHM J	
8	RK04	RD-4P0T0331J	RES-CF, RD 1/4W 330 OHM J	
9	RK05	RD-8P0T0103J	RES-CF, RD 1/8W 10KOHM J	
10	RK06	RD-8P0T0332J	RES-CF, RD 1/8W 3.3K OHM J	
11	SW01	E42027039010	SWITCH TACT,5MM 160GF VER	
12	SW02	E42027039010	SWITCH TACT,5MM 160GF VER	
13	SW03	E42027039010	SWITCH TACT,5MM 160GF VER	
14	SW04	E42027039010	SWITCH TACT,5MM 160GF VER	
15	CNK01	372010139601	CONN-M, SMAW250-02	
16	CNK02	372010138701	CONN-M, SMAW200-05P	
17	LED01	3330600441	LED, A1329B/GYC/R2	
18	SWP01	3700800117	SW-PUSH, CPS-1202 30V 0.3A	

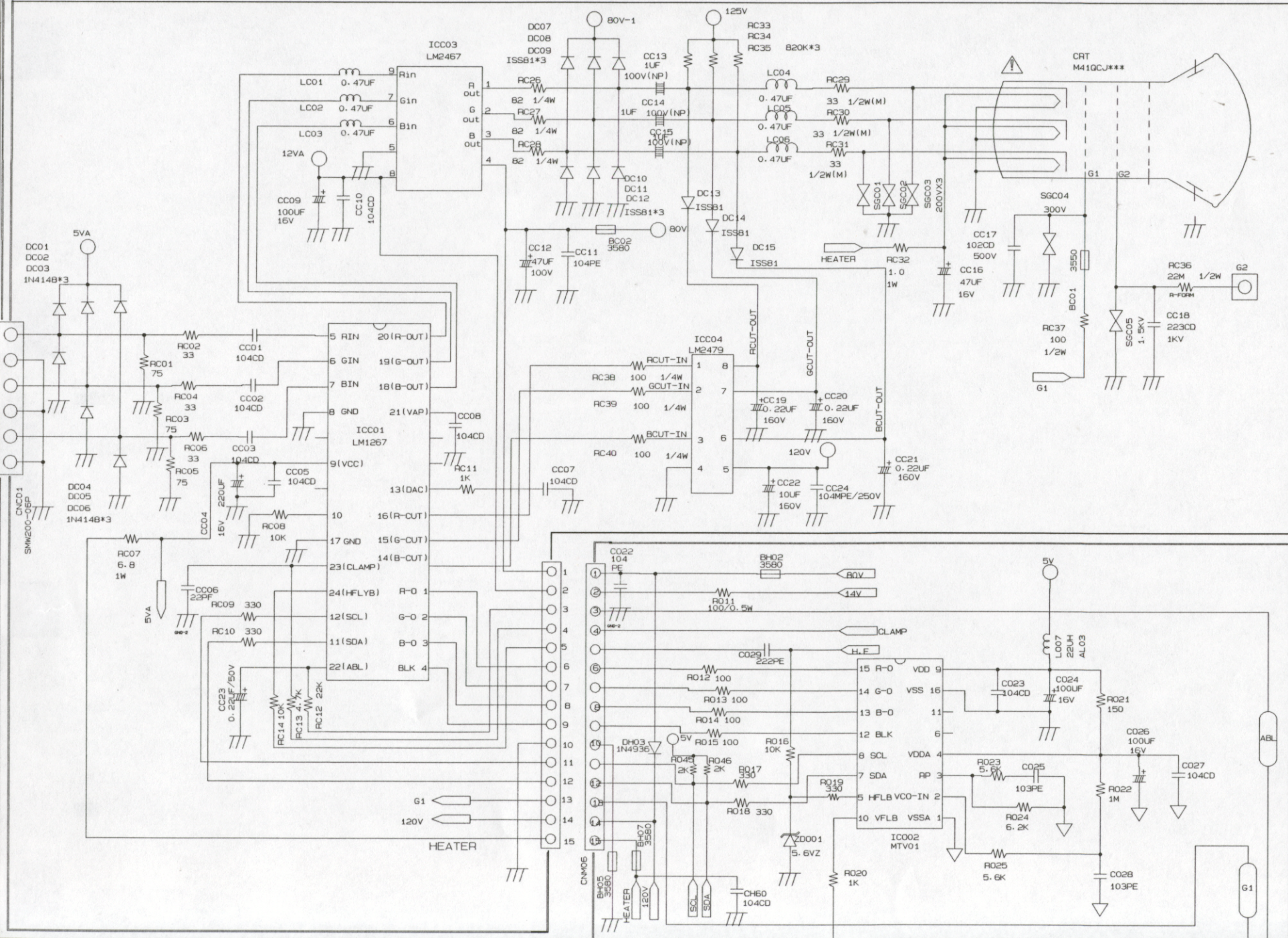
Miscellaneous

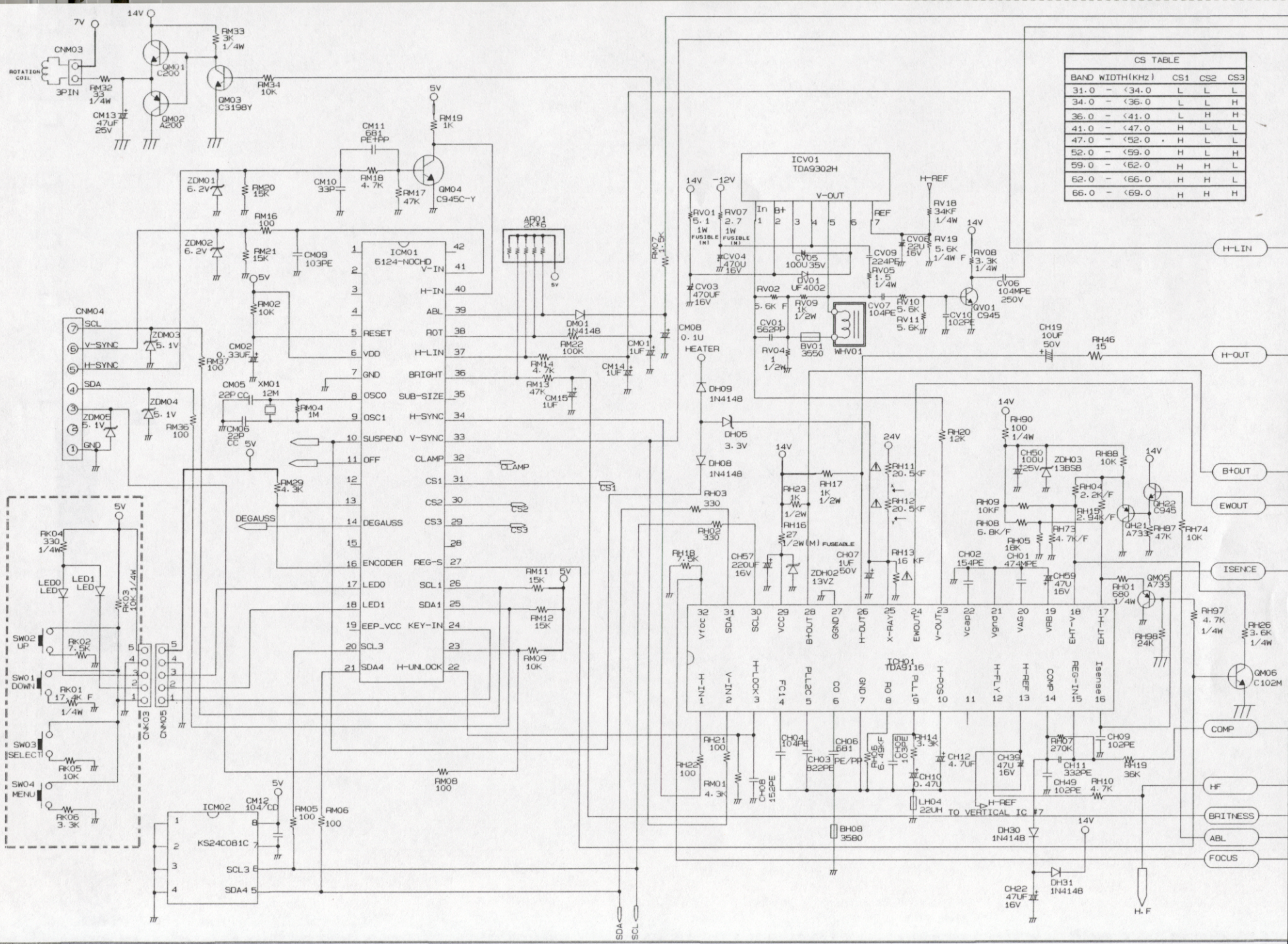
NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
1		B4209531701A	BAG PE(SET)	
2		6201296000	BASE SWIVEL,Q770	
3		B4008500100A	CABLE TIE	
4		B4008500100A	CABLE TIE	
5		6201296200	CAP GATE,Q770	
6		3758000200	CBL-PWR,MW WALL 1.8MT EUR	
7		3758500454	CBL-SGN,Q770 ATTACH 1530M	
8		6320230211	CD MNAUAL IQT ALL	
9		6101218200	CHASSIS MAIN ASSY,Q770	
10		6101218100	CHASSIS MASIN,Q770	
11		6223076900	CLAMP,MOUNT BASE V770 ELO	
12		6155037600	COIL-SP,SPRING Q770	
13		3725005200	CONN-A,15P CBL 150MM Q770	
14		3725005198	CONN-A,2P CBL 300MM Q770	
15		3725005199	CONN-A,5P CBL 230MM Q770/	
16		6120051500	CONTACT-PL BOTTOM ASSY,Q7	
17		6120050700	CONTACT-PLTE,Q770	
18		6201298000	COVER BOTTOM ASSY,Q770	
19		6201295800	COVER BOTTOM,Q770	
20		6201295900	COVER CAP,Q770	
21		6201297900	COVER TOP ASSY,Q770	
22		6201295700	COVER TOP,Q770	
23		3010100158	CRT,M41QCJ761X173 FLAT	
24		6262005000	FOOTER,RUBBER BOTTOM,Q770	
25		6262005100	FOOTER,RUBBER PLATE,Q770	
26		6120051100	GND-PL,GROUND CRT LEFT,Q7	
27		6120050400	GND-PL,GROUND CRT RIGHT,Q	
28		6120030100	GND-PL,SRTING T5870C	
29		3500101855	INDUCT-FIX,Q770 K IH 18UH	
30		6225033000	INSULATION ANODE,Q770	
31		6225033100	INSULATION CRT,Q770	
32		B4210328101	KIT COVER,Q770 IQT	
33		B4204665800	KIT LABEL,Q770/99 CD IQT	
34		6215237000	KNOB POWER,Q770	
35		6215237100	KNOB V/R,Q770	
36		6316345220	LABEL BACK,Q770 IQT	
37		B4204513263B	LABEL,B/CODE 64KHZ(DIC21)	
38		B4204505100C	LABEL,X-RAY WARNING	
39		6220084900	LED LENS POWER,Q770	
40		E4205017601	MAIN ASSY,Q770 EXP	
41		E4208719801	PCB ASSY,Q770 EXP	
42		M17744006012	SCREW,BIN(+) M4*6 MSZPC	
43		5004000204	SCR-TT,BIN + MC 3*8	
44		6327035203	SHEET INSTALL GUIDE,IQT A	
45		6120050200	SHIELD COVER,Q770	

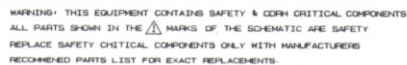
NUM.	LOCATION	PART NUMBER	DESCRIPTION	REMARK
46		6120042800	SHIELD GROUND SPRING,V770	
47		6120042800	SHIELD GROUND SPRING,V770	
48		6120050800	SHLD-CASE COVER ASSY,Q770	
49		6120050900	SHLD-CASE,F/SHLD CRT ASY,	
50		6120050300	SHLD-CASE,SHIELD PLATE Q7	
51		6120050100	SHLD-PL,FENCE SHIELD CRT	
52		6316345101	STICKER CABINET,TC0 '99	
53		6201298100	SWIVEL ASSY,Q770	
54		6201300100	TILT&SWIVEL ASSY,Q770	
55		375500078906	WIRE-ASS'Y,COPPER ASSY Q7	


MODEL: Q770
CHASSIS NO: C-1724







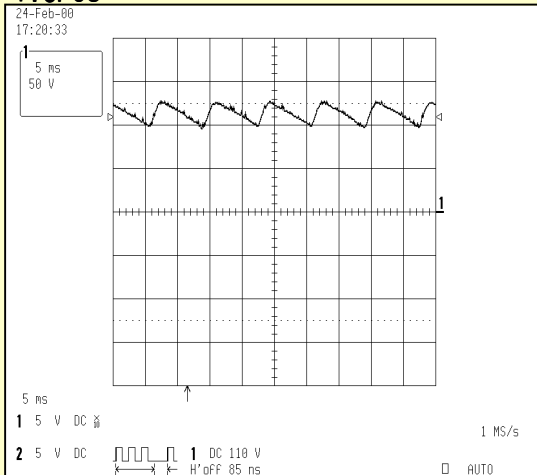


ENG. REV.	REV01	DESCRIPTION	DOC. NO.	DATE	APPROVAL
ENG. NO.	E42045367	SIGNATURE	DATE	INSP	SHEET NO.
TITLE Q770		DNH Y. T. KIM	2001.06.01		1 /
		CHK J. R. KIM	2001.06.01		
 HYUNDAI DAEWOO		APP Y. K. RYUN	2001.06.01		
					1

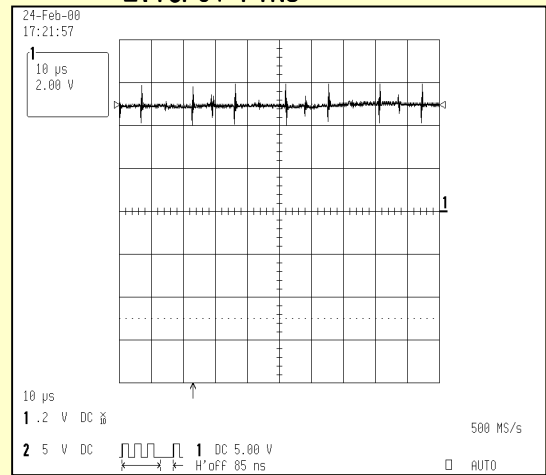
Wave Form

[1024X768@85Hz,Full White pattern]

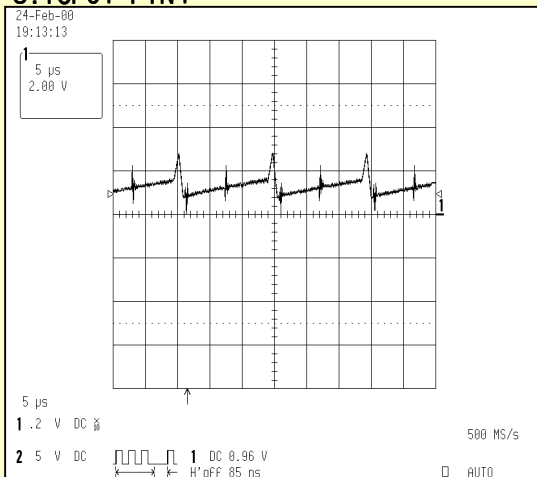
1.CP05 "+"



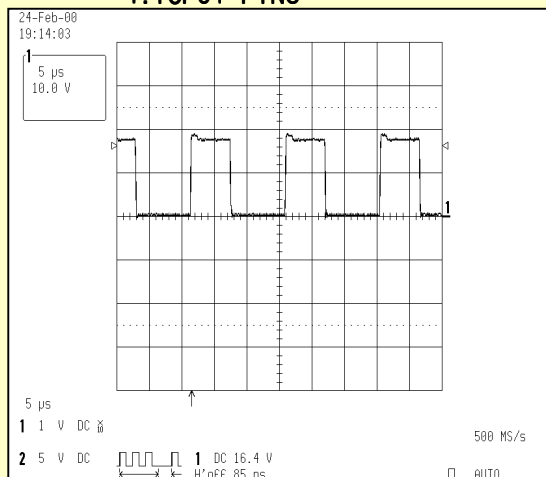
2.ICP01 PIN8



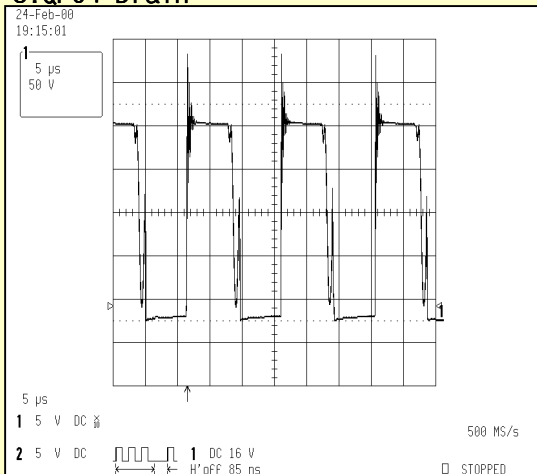
3.ICP01 PIN4



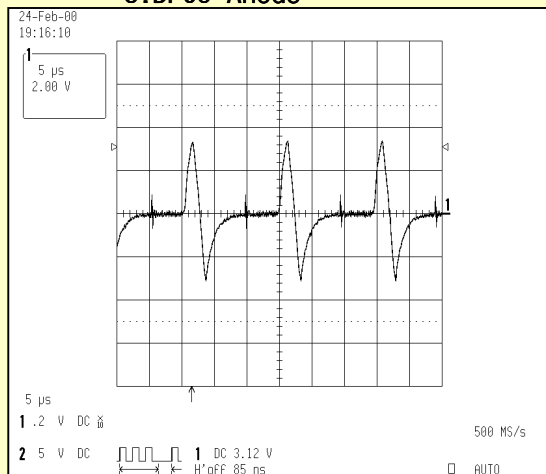
4.ICP01 PIN6



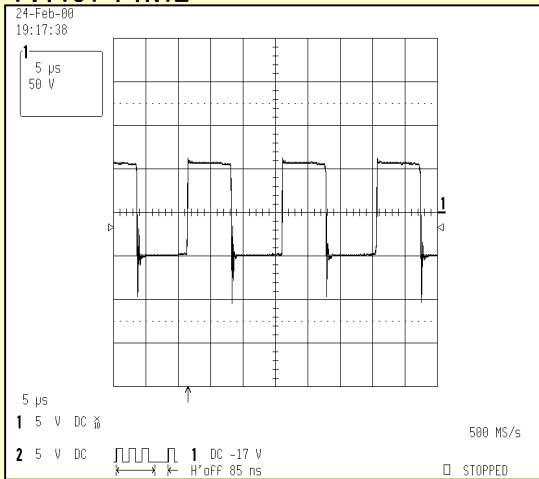
5.QP04 Drain



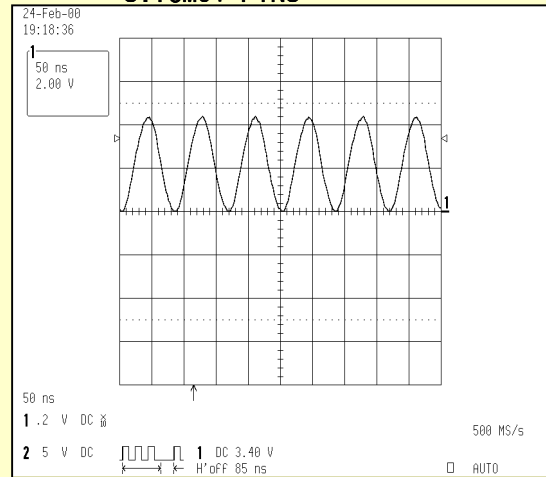
6.DP09 Anode



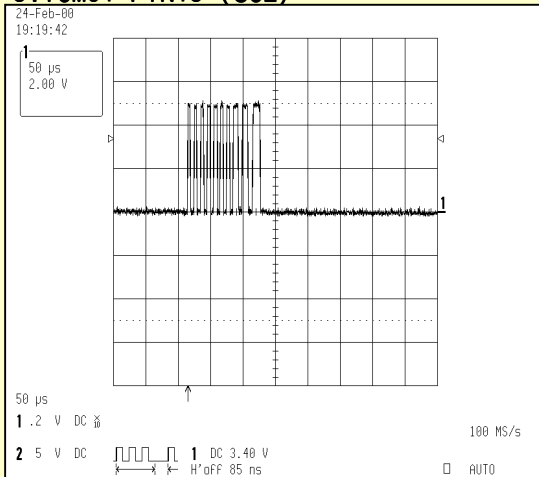
7.T101 PIN12



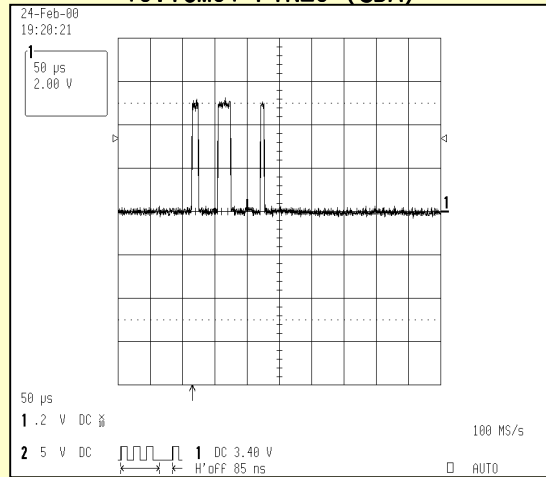
8.ICM01 PIN8



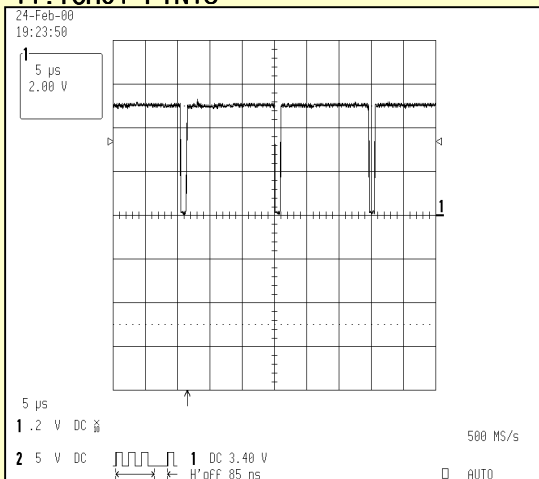
9.ICM01 PIN19 (SCL)



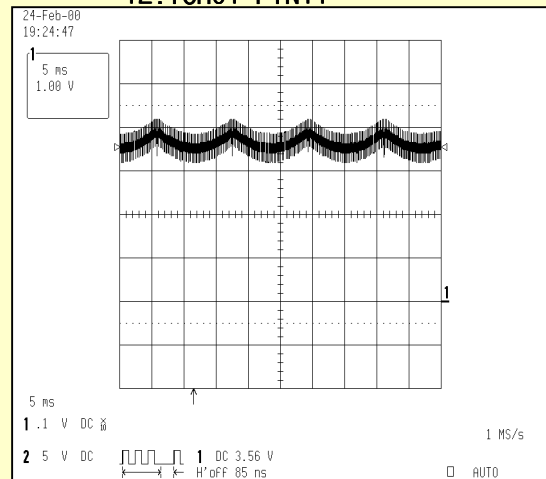
10.ICM01 PIN20 (SDA)



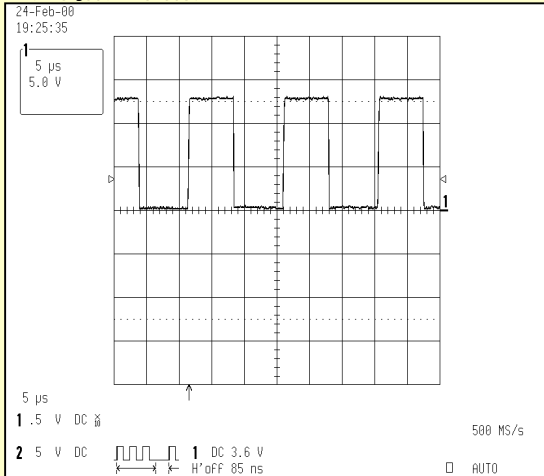
11.ICH01 PIN15



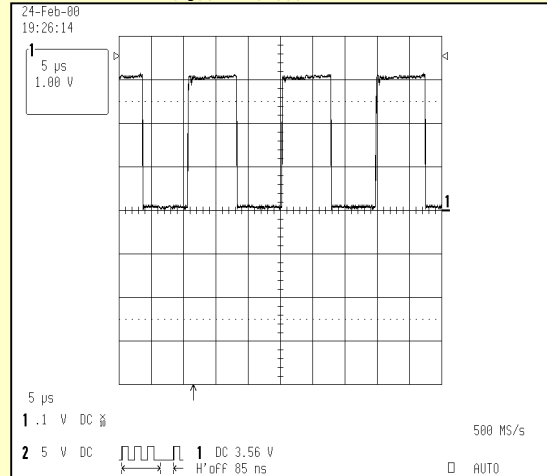
12.ICH01 PIN11



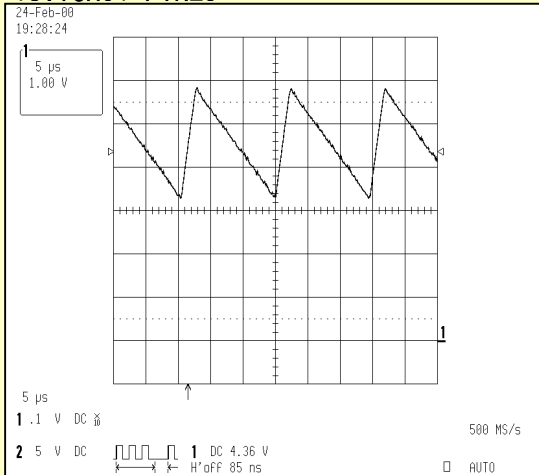
13. ICH01 PIN8



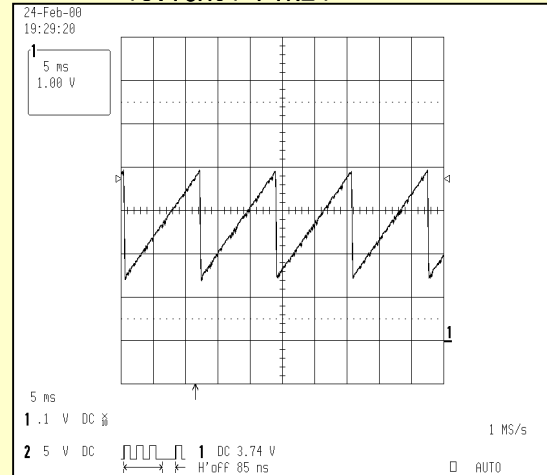
14. ICH01 PIN6



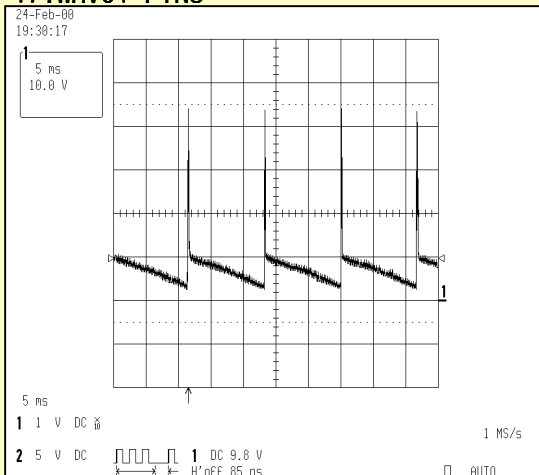
15. ICH01 PIN29



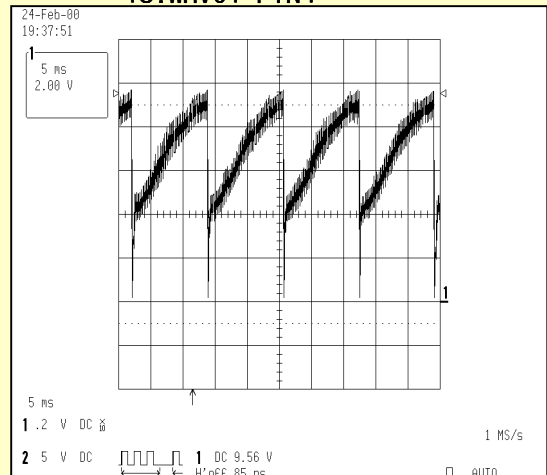
16. ICH01 PIN24



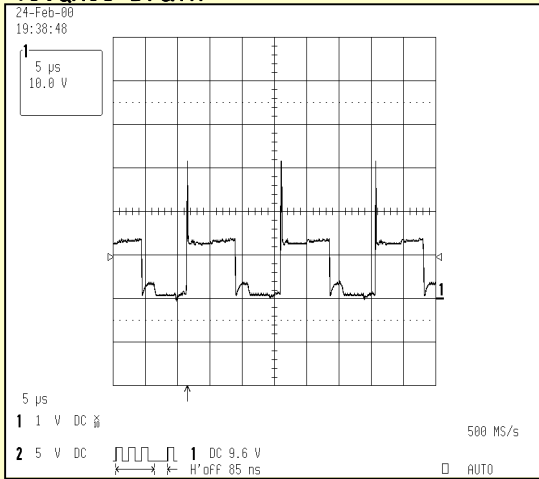
17. WHV01 PIN3



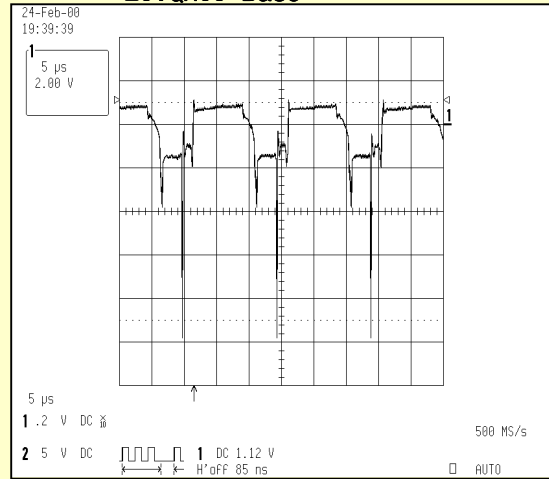
18. WHV01 PIN4



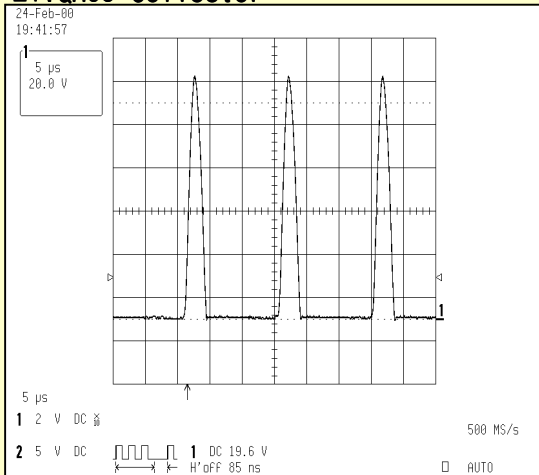
19.QH08 Drain



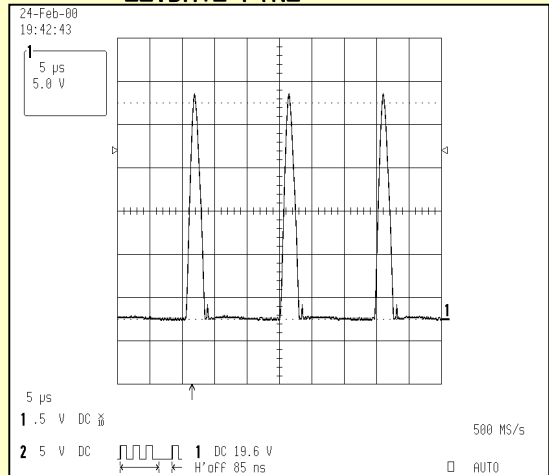
20.QH09 Base



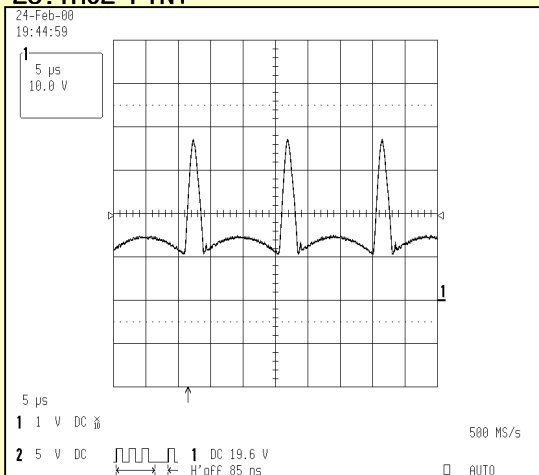
21.QH09 Collector



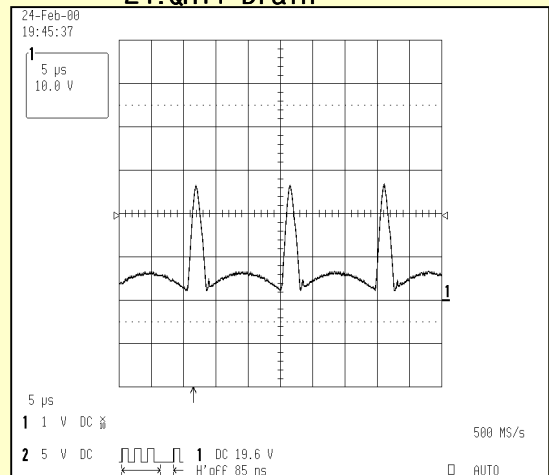
22.DH12 PIN2



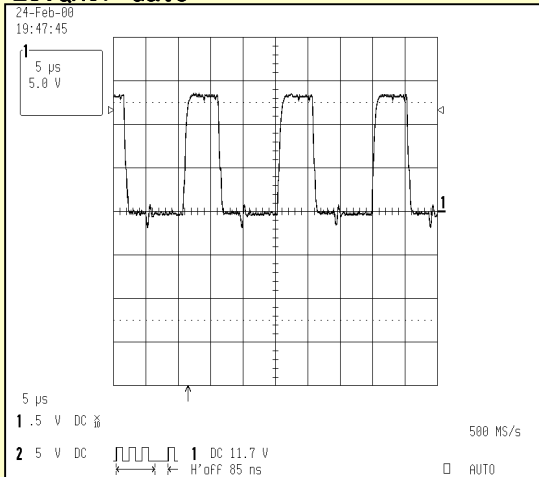
23.TH02 PIN1



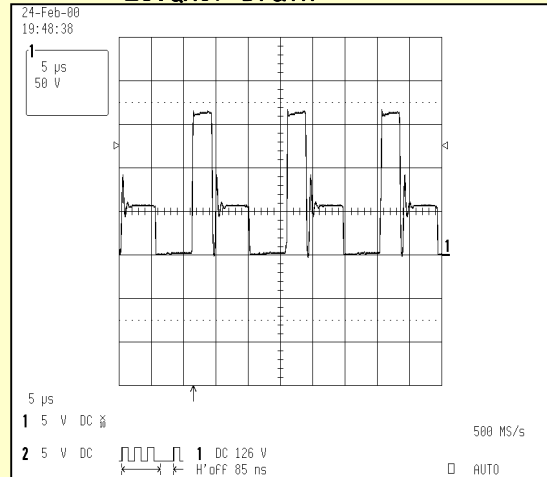
24.QH11 Drain



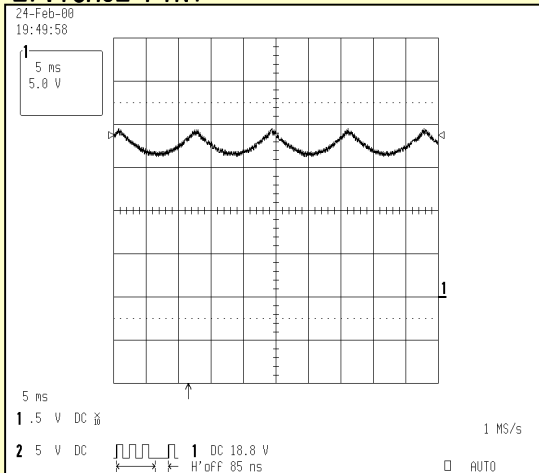
25.QH07 Gate



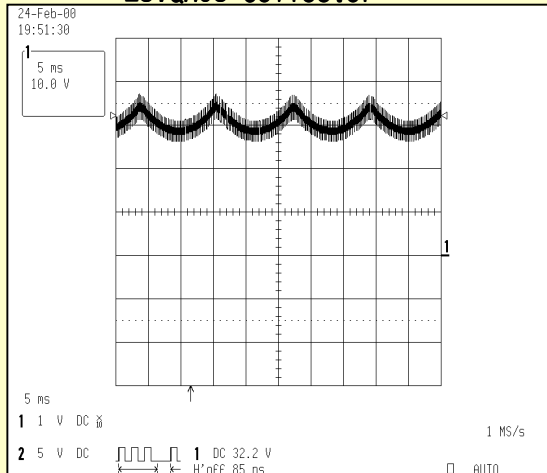
26.QH07 Drain



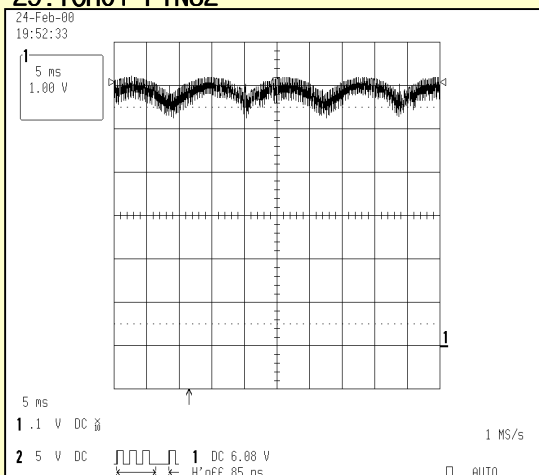
27.ICH02 PIN1



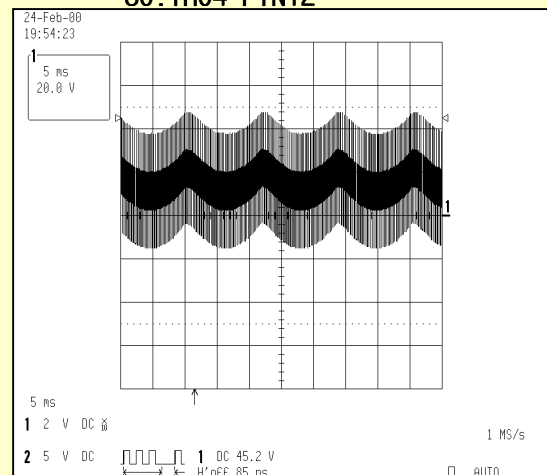
28.QH03 Collector



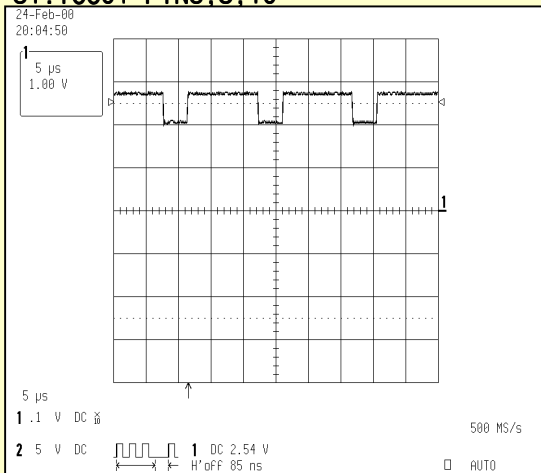
29.ICH01 PIN32



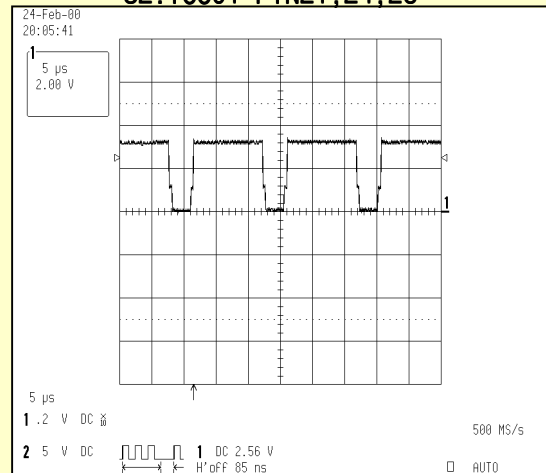
30.TH04 PIN12



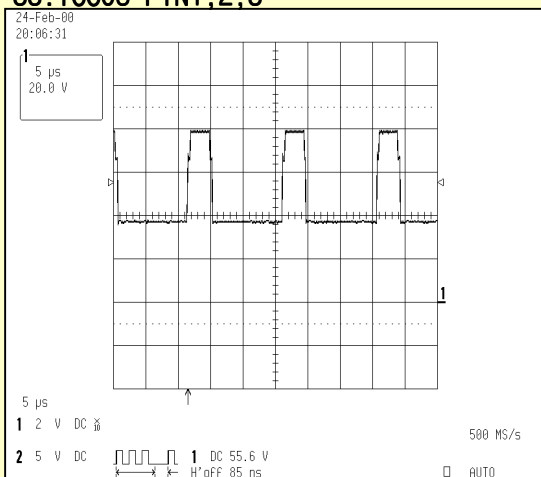
31. ICC01 PIN5,8,10



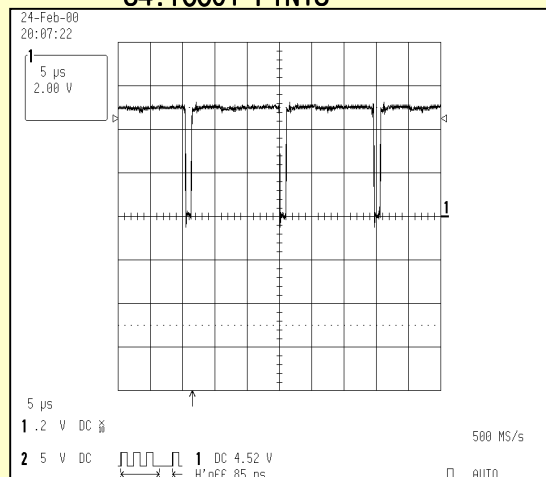
32. ICC01 PIN21,24,26



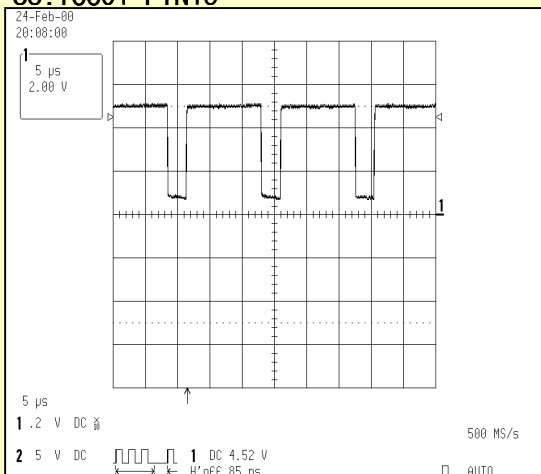
33. ICC03 PIN1,2,3



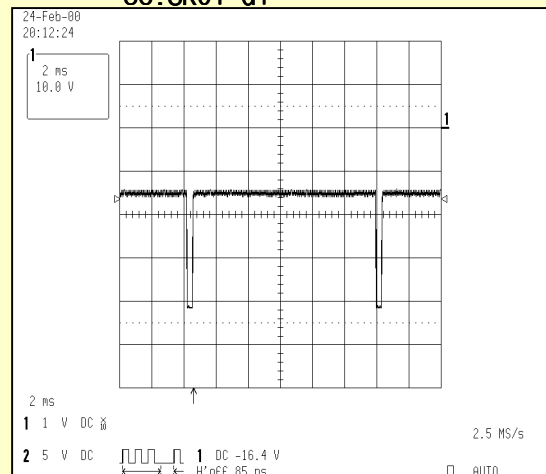
34. ICC01 PIN18

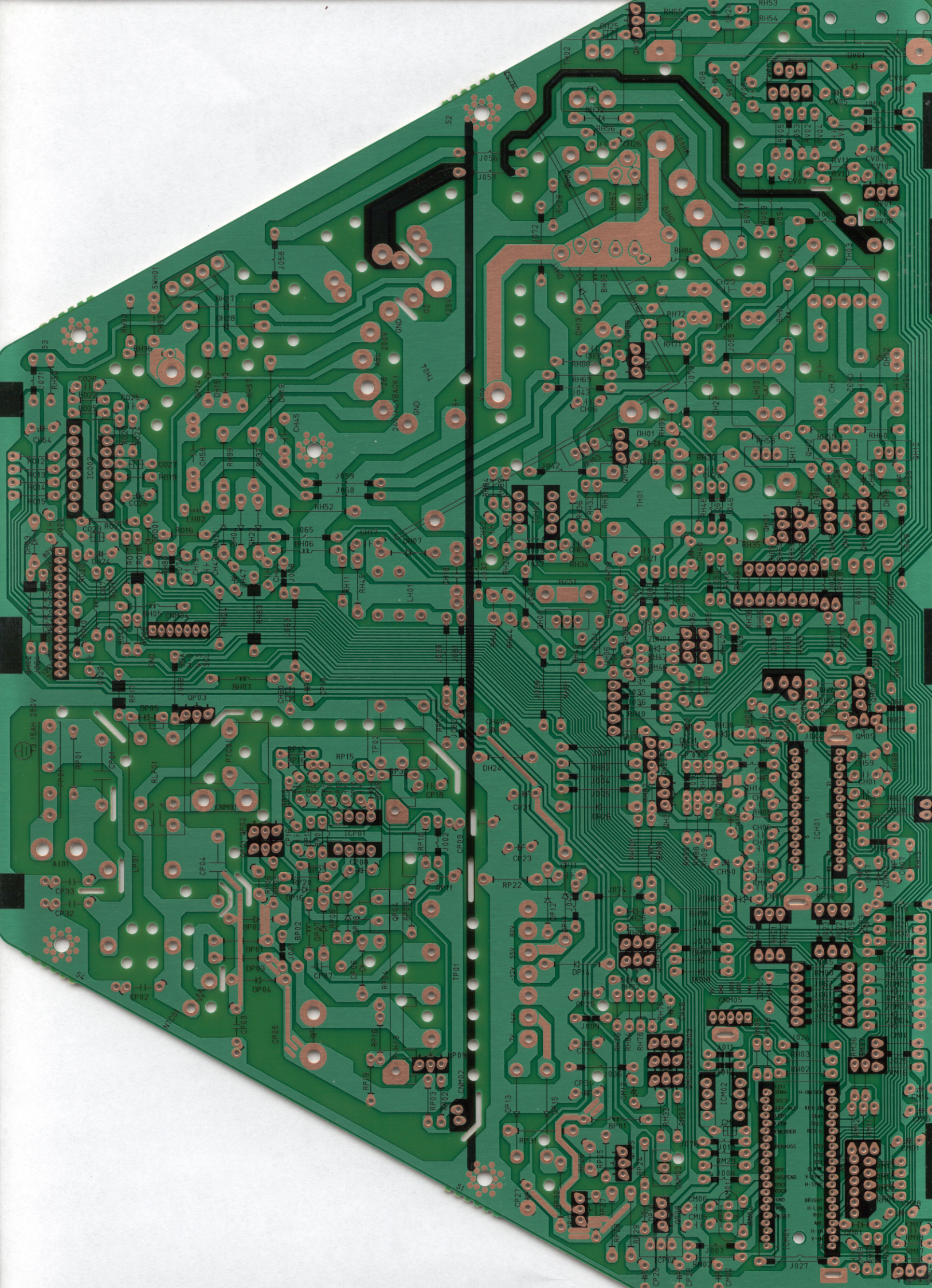


35. ICC01 PIN19

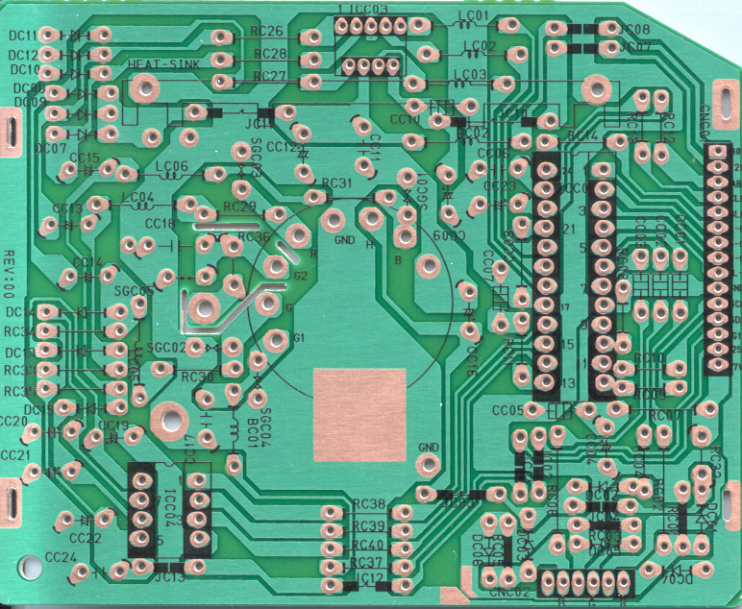


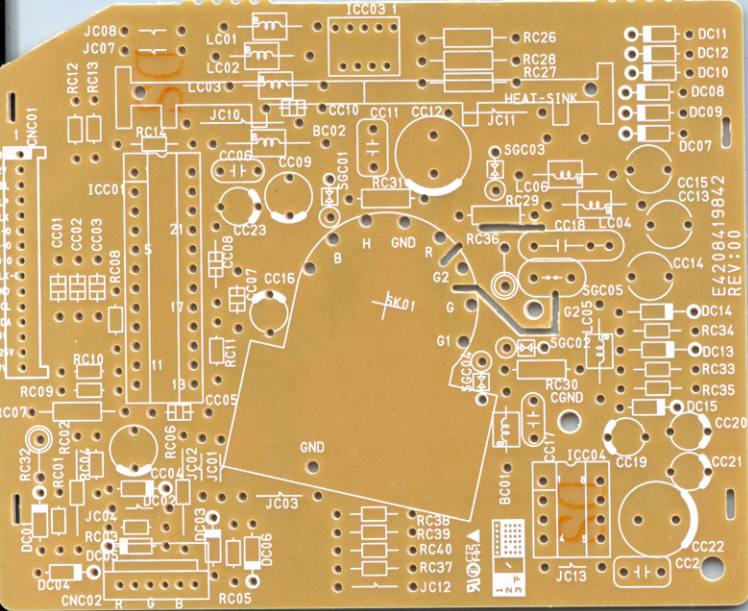
36. SK01 G1

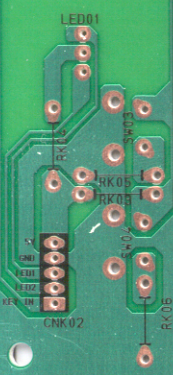
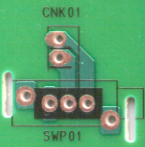
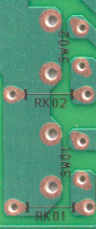




V19







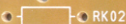
Q770KEY

E4208419843 REV:00



CT2
V-0-1 ▲

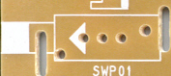
SW02



SW01



CNK01



LED01



SW03



RK03



RK06



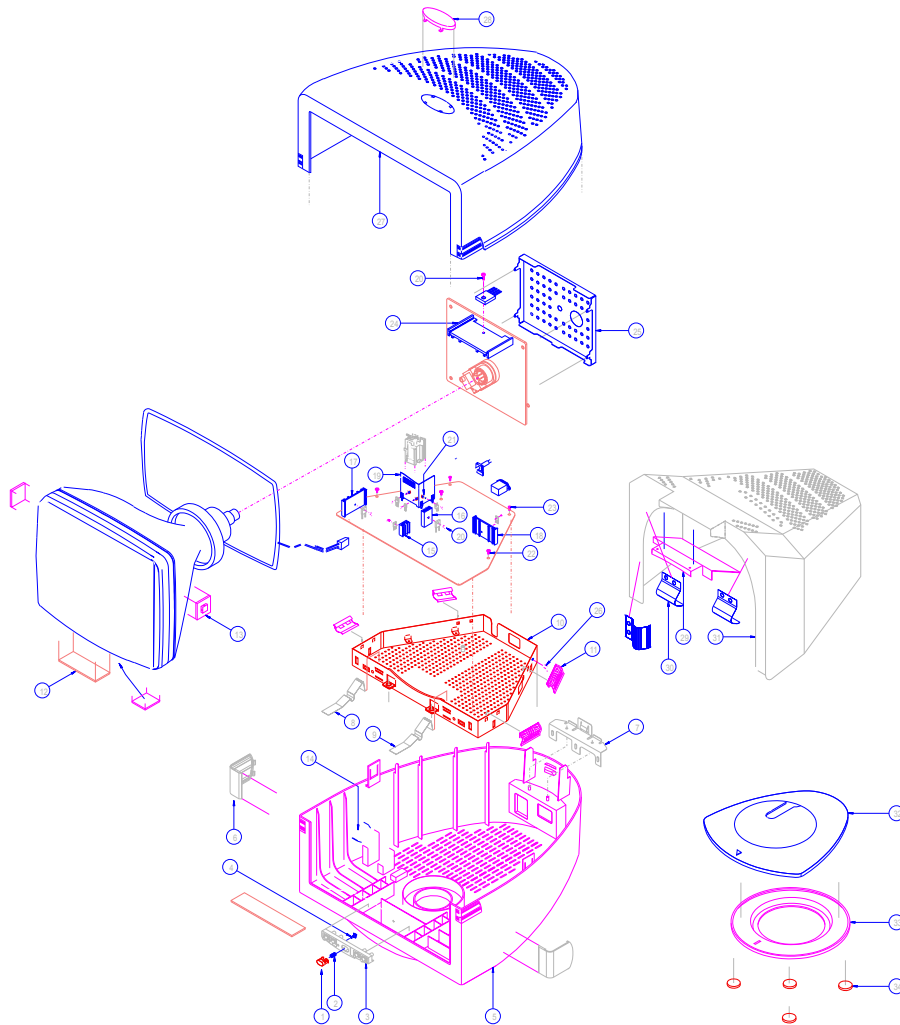
RK05

RK04

5V
GND
LED1
LED2
KEY IN

CNK02





34	6262005000	RUBBER BOTTOM	SL-9816 POLYURETHANE	4	
33	6120050700	BOTTOM PLATE	SECC T=2.0	1	
32	6201296000	SWIVEL BASE	ABS 94HB	1	
31	6120050200	SHLD-CASE COVER ASSY	A050P T=0.3	1	
30	6120051800	GROUND SPRING	C5210H T=0.1	2	
29	6225033000	INSULATION-ANODE	ABS+PC	1	
28	6201296200	CAP GATE	ABS 94HB	1	
27	6201295700	TOP COVER	ABS 94HB	1	
26	M17744006012	SCREW BIN(+)	4# MSZPC	1	
25	6120050900	SHLD-PL FENCE CRT ASSY	SPTT T=0.3	1	
24	6124035903	HEAT SINK V	A050P	1	
23	5004002004	SCR-TT WAL 3"8	MSZPC	2	
22	6129027800	SPECIAL T.TW(+)	3"8 MSZPC	3	
21	M31100030012	NUT HEX 6N1-3	MSZPC	3	
20	M11143038012	SCREW BIN(+)	3# MSZPC	8	
19	6120051000	F/SHIELD FBT ASSY	A050P	1	
18	6124035602	HEAT SINK V	A050P	1	
17	6124035600	HEAT SINK V	A050P	1	
16	6124020510	HEAT SINK POWER	A050P	1	
15	6124020508	HEAT SINK POWER	A050P	1	
14	6262005100	RUBBER PLATE	SL-9816 POLYURETHANE	2	
13	6223016900	MOUNT BASE V770	—	3	
12	6225033100	INSULATION CRT	PE	1	
11	6120043800	GROUND SPRING V770	SUS 304	4	
10	6101218100	CHASSIS MAIN OT70	SECC T=0.9	1	
9	6120050400	GROUND CRT RIGHT	SPTT T=0.3	1	
8	6120051100	GROUND CRT LEFT	SPTT T=0.3	1	
7	6120050300	SHIELD PLATE	SPTT T=0.3	1	
6	6201295900	COVER CAP	ABS+PC	2	
5	6201295800	BOTTOM COVER	ABS 94HB	1	
4	6220084900	LENS LED POWER	LUCKY PMMA IF 850	1	
3	6215237100	KNOB V/R	ABS 94HB	1	
2	6155037800	SPRING COM.	SUS 304	1	
1	6215237000	KNOB POWER	ABS 94HB	1	
NO.	PART NO.	PART NAME	DESCRIPTION	QTY	품 명

EXPLODED VIEW	REV
EXPLODED VIEW	A
02/05	
A	
02/05	
B421012301A	

